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SOUTH AFRICAN MINING JOURNAL AND ENGINEERING RECORD

The Only Weekly Mining Paper in the Union and Rhodesia.



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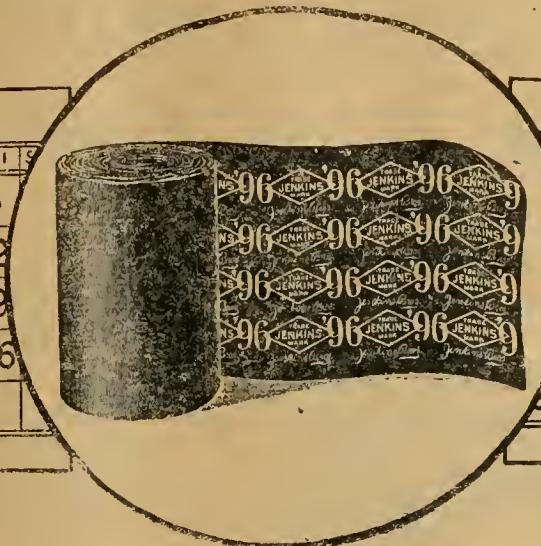
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HEAD OFFICES: 81, 82, 83, 84, Cullinan Building, Johannesburg.

JANUARY						
SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	
7	8	9	10	11	12	
14	15	16	17	18	19	
21	22	23	24	25	26	
28	29	30	31			

DECEMBER						
SUN	MON	TUE	WED	THU	FRI	SAT
	2	3	4	5	6	7
9	10	11	12	13	14	
16	17	18	19	20	21	
23	24	25	26	27	28	
30	31					



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## Jenkins '96 Packing Gives Satisfactory Service

IT is the long service packing—the always uniform kind. No matter what month you buy it in—from January to December—you will find the same fine quality that makes Jenkins '96 the packing that hundreds of careful engineers use in preference to any other. These are the reasons:—

### Because It Is Elastic

It vulcanizes as soon as the steam is turned on but it never becomes brittle. If the surface of the joint expands or contracts the elasticity of Jenkins '96 takes care of it.

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Jenkins '96 makes a joint that stays tight for a long time. No need of constantly watching and worrying about joints with Jenkins '96 in them. No overtime and Sunday work fussing over leaky joints for the engineer who uses it.

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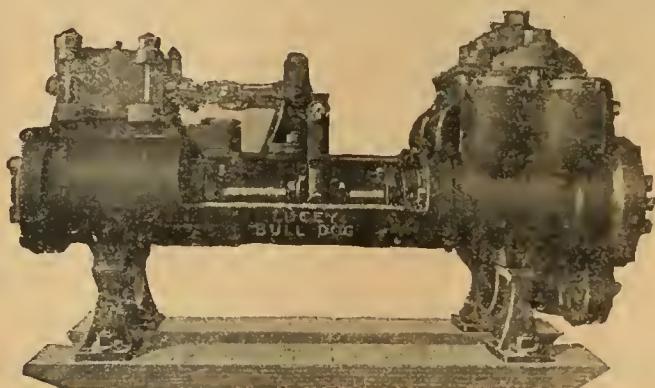
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**FORCED FIT Valve Seats.**  
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Rods, Tubes, Wire, Plates, Sheets, Strip,  
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DIAMOND EMERY WHEEL DRESSERS.

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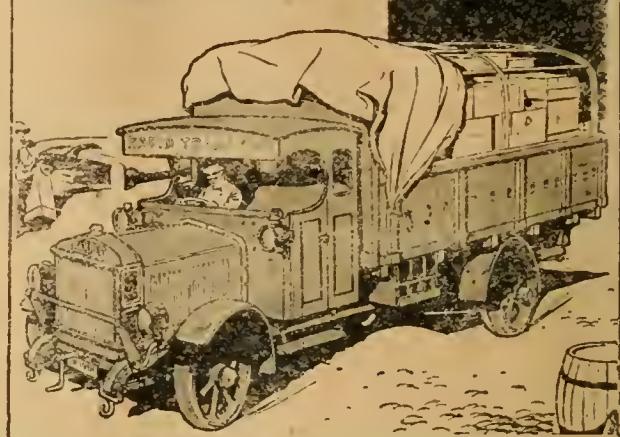
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**KARRIER**

Designed and built by  
**KARRIER WORKS**  
 HUDDERSFIELD - ENGLAND

**Zaaiplaats Tin Mining Company, Ltd.**

(Incorporated in the Transvaal.)

**Notice of Declaration of Dividend No. 17.**

NOTICE IS HEREBY GIVEN that an interim Dividend of 30 per cent. (i.e., 1s. 6d. per share) has been declared payable to shareholders registered in the books of the Company at the close of business on Wednesday, the 31st day of July, 1918.

Dividend Warrants will be posted to South African shareholders from the Head Office, Pretoria, as soon as possible after the receipt of the final Transfer Returns from London, and to European shareholders from the London Office, Pinners Hall, Austin Friars, E.C.

The Share Transfer Register will be closed from the 1st to the 6th day of August, 1918, both days inclusive.

No deduction will be made from the amounts due to South African shareholders in respect of any dividend tax payable by the Company to the Union Government.

By Order of the Board.

H. P. WEBBER, Secretary.

Tudor Chambers,

Church Square, Pretoria.  
 13th July, 1918.

**Glynn's Lydenburg, Ltd.**

(Incorporated in the Transvaal.)

**· DECLARATION OF DIVIDEND No. 34.**

A DIVIDEND of 7½ per cent. (1/6 per share), free of South African Tax, has been declared by the Board for the period ending 31st July, 1918, payable to Shareholders registered in the books of the Company at the close of business on 31st July, 1918.

The Transfer Books will be closed from the 1st to the 7th August, 1918, both days inclusive.

If possible the dividend will be paid early in September, 1918, but owing to the irregularity in the mail service it is impossible to state the actual date of payment. The Warrants, however, will be despatched to Shareholders as soon as possible after receipt of the final Transfer Returns from the London Office. Those despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax.

By Order of the Board,  
 TRANSVAAL CONSOLIDATED LAND AND EXPLORATION COMPANY, LIMITED,

Secretaries,  
 Per C. L. READ,

Head Office,  
 The Corner House,  
 Johannesburg,  
 17th July, 1918.

# STANDARD BANK

## OF SOUTH AFRICA, LIMITED.

ESTABLISHED 1862.

Bankers to the Government of the Union of South Africa in the Cape Province; to the Imperial Government in South Africa; and to the Administration of Rhodesia.

Subscribed Capital	-	-	£6,194,100
Paid-up Capital	-	-	£1,548,525
Reserve Fund	-	-	£2,000,000

## BOARD OF DIRECTORS:

Wm. Relerson Arbuthnot, Esq.	Horace Peel, Esq.
Sir David Miller Barbour, K.C.S.I., K.C.M.G.	William Smart, Esq.
Robert Edmund Dickinson, Esq., J.P.	Right Hon. Lord Sydenham, G.C.S.I., G.C.M.G., G.C.I.E., F.R.S.
James Fairbairn Finlay, Esq., C.S.I.	Major Herbert Leslie Melville Tritton.

## HEAD OFFICE:

10, CLEMENTS LANE, LOMBARD STREET, LONDON, E.C.4  
NEW YORK AGENCY: 68, WALL STREET.

## HEAD OFFICE IN SOUTH AFRICA: CAPE TOWN.

General Manager	-	-	Hector Mackenzie.
Deputy General Manager	-	-	J. P. Gibson.
Assistant General Manager	-	-	Noel Jennings.

## OVER 250 BRANCHES AND AGENCIES

in the Union of South Africa, Rhodesia, Nyasaland, East Africa Protectorate, Uganda, Portuguese East Africa, Protectorate of South-West Africa, and the Territory formerly known as German East Africa.

BALANCE SHEET, 31st DECEMBER, 1917.

LIABILITIES.	£	s. d.	ASSETS.	£	s. d.
Nominal Capital .....	£6,250,000	0 0	Cash in hand .....	£4,677,450	16 3
Capital Subscribed .....	£6,194,100	0 0	Cash at Bankers, and at call, and short notice	3,115,219	5 1
Called up £5 per Share .....	1,548,525	0 0	7,792,670	1 4	
Reserve Fund .....	2,090,000	0 0	916,284	15 10	
Notes in Circulation .....	2,155,683	0 0	31,679	1 2	
Deposit, Current, and other Accounts, including provision for Contingencies .....	32,981,023	12 5	*Investments in War Loan, Exchequer Bonds, National War Bonds, Colonial Government, Municipal, and other Securities (including deposits of Stock with the Union Government) .....	3,767,354	7 8
Drafts Outstanding and Acceptances under Credits .....	1,228,236	9 9	Bills of Exchange purchased and current at this date .....	7,865,095	13 7
Customers Bills for Collection, per contra	3,953,430	15 0	Bills Discounted, and Advances to Customers (including Stock Exchange Loans under Treasury Minute of 31st October, 1914) .....	19,263,569	19 8
Profit and Loss—			Customers Bills for Collection, per contra Suspense Items pending returns from Hamburg Agency .....	3,953,430	15 0
Dividend and Bonus for the half-year ended 31st December, 1917, to be paid .....	£129,043	15 0	Bank Property and Premises (including Furniture and Fittings) at cost, less amounts written off .....	45,928	18 7
Officers' Pension Fund .....	30,000	0 0	Stamps, Stationery, and Open Policies ...	581,059	12 0
Balance Carried Forward .....	204,333	7 2		13,202	14 6
£44,230,275	19	4	£44,230,275	19	4

\* These investments, including the War Loan, have been valued at, or under, market prices as at 31st December, 1917.

# THE NATIONAL BANK OF SOUTH AFRICA, LIMITED.

(With which are incorporated the BANK OF AFRICA, Ltd., established 1879, the NATIONAL BANK OF THE ORANGE RIVER COLONY, Ltd., established 1877, and the NATAL BANK, Ltd., established 1854.)

Bankers to the Union Government in the Transvaal the Orange Free State and Natal, and to the Imperial Government.

CAPITAL SUBSCRIBED AND PAID UP	-	£2,850,000
WITH POWER TO INCREASE TO	-	£4,000,000
RESERVE FUND	-	£850,000

## DIRECTORS:

The Hon. HUGH CRAWFORD (Chairman).	J. EMRYS EVANS, C.M.G. (Vice-Chairman).
J. ELLIS BROWN.	JAMES B. TAYLOR.
PATRICK DUNCAN, C.M.G., M.L.A.	Senator The Hon. Sir ANTONIE G. VILJOEN.
The Hon. ALBERT OLIFF.	The Hon. Sir EDGAR H. WALTON, K.C.M.G., M.L.A.
E. J. RENAUD.	H. O'K. WEBBER.

## GENERAL MANAGER:

E. C. REYNOLDS.

**Head Office - - - - PRETORIA.**

**LONDON OFFICES: Circus Place, London Wall, E.C. 2, and 18, St. Swithin's Lane, E.C. 4.**  
**NEW YORK AGENCY: 10, Wall Street.**

**THE BANK HAS OVER 300 BRANCHES AND AGENCIES,**

In the principal Towns in the Cape Province, Transvaal, Orange Free State, Natal, Rhodesia, Portuguese Territory, East Africa, the South West Protectorate and Nyasaland.

Agents in British West Africa, the Belgian Congo, Mauritius, Madagascar, etc.

Agents at Amsterdam, Paris, Petrograd and Rome, and the principal Cities of the World.

## BALANCE SHEET 31st MARCH, 1918.

LIABILITIES.		ASSETS.
To Subscribed Capital	£2,850,000 0 0	By Cash on hand and with
285,000 Shares of £10 each (fully paid)	700 000 0 0	Bankers £4,838,040 4 10
Reserve Fund	2,585,924 10 0	.. Remittances in Transit 1,473,209 10 11
Notes in Circulation	32,138,306 15 11	.. Native Gold on Hand and in
Deposits, Current and other Accounts	1,649,506 10 5	Transit 31,522 12 6
Drafts issued on Branches and Agents and Acceptances outstanding at date	50,087 4 7	.. Money in London at Call and Short Notice
Bills Receivable on Account of Customers	5,550,235 3 6	against Securities 2,212,463 7 9
Profit and Loss Account:-		.. British and Colonial Government and other
Balance undivided at 31st		Securities (including Stock lodged with
March, 1917 £49,134 3 3		the Government of the Union of South
Net Profit year ended 31st		Africa), written down to 31st March, 1918.
March, 1918 352,601 17 10		quotations 4,756,491 0 4
	£401,736 1 1	.. Bills of Exchange, purchased and current
<i>Less</i> Interim Dividend declared 26th November,		at this date 8,003,548 5 8
1917 85,500 0 0	316,236 1 1	.. Bank Premises and other Properties in South
Contingent liability in respect of		Africa 720,855 19 7
Loans guaranteed and secured	159,643 11 7	.. Bills Discounted, Loans, etc. 18,129,107 6 6
	£45,999,939 17 1	.. Bank Furniture and Fittings, Stationery and
		Stamps 124,822 13 11
		.. Bills for Collection 5,550,235 3 6
		Loans guaranteed and secured (as per contra) 159,643 11 7
		£45,999,939 17 1

Officials of the Bank are bound to secrecy in regard to the transactions of any of its customers.

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#### ANDREW, RESTIEAUX & CO.

Manufacturers of Solders, Bearing Metals, Printers' Alloys, and all classes of non-ferrous Ingot Material. Proprietors of the Knoxite Brand of Antifriction Metals.—246 Fox Street, Johannesburg, 'Phone 3753, Telegrams "Andesia."

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#### BRITISH GENERAL ELECTRIC CO., LTD.

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(W. M. HUDSON, Managing Director.)

Foundry Plumago, Flake Graphite, Pipe Jointing, "Murrella" Boiler Composition, Graphite Pigment, Electrical Graphite, etc. Offices and Works: 234 Anderson Street, Johannesburg. 'Phone 2560.

#### WADE & DORMAN, LTD.

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#### WHARTON HOOD & CO., LTD.

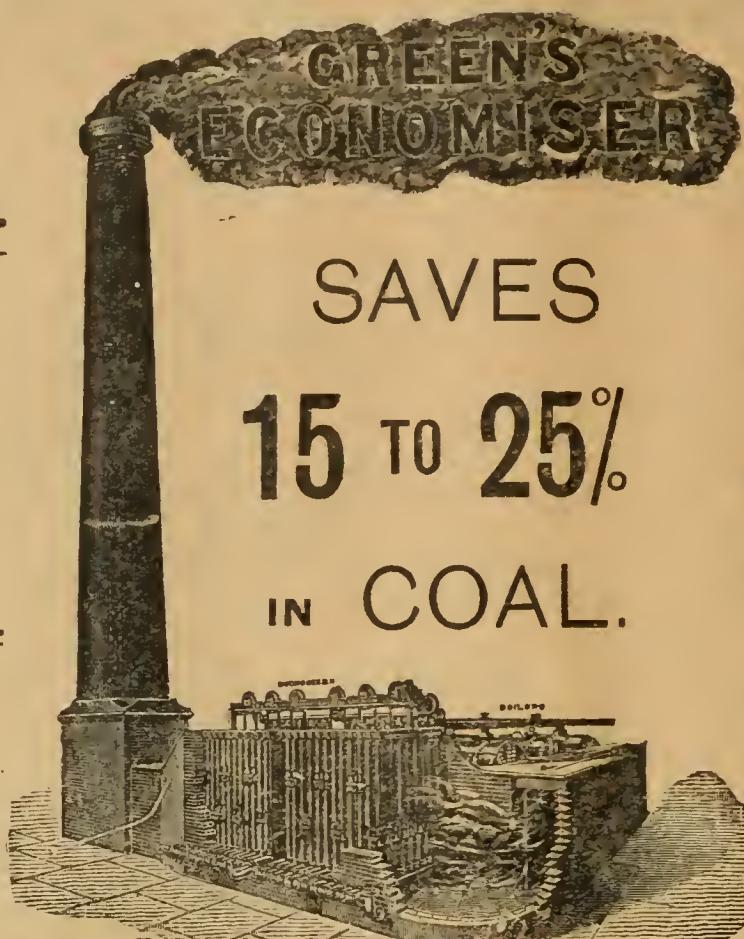
Box 6096, Telephone 973, Tel. Address: "Castings." Sole Agents for Jenkins Bros., Ltd., Montreal; Geo. Christie, Ltd., Glasgow; James Walker & Co., Ltd., London; Garlock Packing Co., New York. Offices: Southern Life Buildings, Johannesburg.

#### C. F. WIENAND.

Commercial Exchange Buildings, Johannesburg; 'Phone 3. Sole Agent for Toledo Steels of all classes, Butterley Iron, Barwell's Bolts, Scott's Ropes, Mine Lubricants, Ltd. All highest quality.

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*Prolongs the*  
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C/o Miller and Eighth Streets.

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THE SOUTH AFRICAN  
**Mining Journal**  
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## Notes and News.

The news of the dreadful disaster at the Meyer and Charlton on Thursday, whereby twenty-one white miners lost their lives, cast a gloom over the whole Rand this week. For some unexplained reason a trailer attached to the rock-skip by a nine-foot rope became detached on the descent, and was precipitated with its twenty-one occupants into the sump some thousand feet below. The cause of the rope breaking is at present unknown, but the Government enquiry, which opens on Monday, may throw light on the matter. Meanwhile, the sympathy of the whole community goes out to the wives and families of the victims of this, fortunately for the Rand, unique tragedy.

\* \* \* \*

The latest Commission on the working of the Miners' Phthisis Acts began its sittings this week, **The Phthisis Commission.** and has up to the present been occupied mainly in taking the evidence of Mr. H. O. Buckle. The lengthy and important testimony of the President of the Miners' Phthisis Board had not been completed at the time of our going to press, and a full report of it is, therefore, held till our next issue.

\* \* \* \*

The chairman of the Johannesburg Stock Exchange, Mr. D. C. Greig, has favoured us with the following views on the much-discussed **The Gold Question.** gold question:—"It seems to me," said Mr. Greig, "that bank realization charges on the gold output are excessive. They are a factor, though possibly not a deciding factor, in the position of the low-grade mines. If they were reduced by half, it would help, though something more is needed to meet the situation. I do not see, however, that we can ask the Imperial Government to help us in the matter. The British people are bearing just now extraordinary heavy financial burdens, uncomplainingly. It is not fair of us to ask them to take on fresh liabilities to help us. The country has done well during the war, and has felt its burdens much less than Great Britain has. The question is mainly one for the Union Government, and the problem ought not to be incapable of solution by the industry and the Government. I do not believe that the output of the low-grade mines means much to the credit of the Imperial Government. Its credit is independent of any increase or decrease in the Rand gold output."

\* \* \* \*

Why tin mining in Swaziland should be singled out for an excess profits tax of 25 per cent. is not **Excess Profits Tax on Swazi Tin.** quite clear. A notice in the *Gazette of the High Commissioner* this week, however, imposes that tax from July, 1918, and excess profits will be taken to mean profits made exceeding the average of those made during nine years previous to June 30, 1914. The only people to suffer are, of course, the shareholders in Swazi Tins.

\* \* \* \*

We are informed that the French Minister of Finance has given permission for shareholders in **A. Goerz & Co., Ltd.** Goerz & Co., Ltd., resident in France to be offered their proportion of the Goerz shares recently purchased from the Custodian of Enemy Property for the Union of South Africa.

\* \* \* \*

According to a Reuter cable, Sir Lionel Phillips, interviewed by a representative of the *Observer*, **Sir Lionel Phillips on the Gold Question.** predicted a most serious falling-off in the production of gold unless the present unfair system of paying producers at pre-war currency was altered. A committee, consisting of himself, Lord Harris, Lord Newton, Mr. Moore, Mr. Edgar Taylor, Mr. D. O. Malcolm and Mr. Herbert Blythe, had been appointed to prepare a case for

presentation to the Government. They addressed a letter to Mr. Bonar Law. It would be improper to discuss its contents, but he could say they requested an expert inquiry, for the problem was extremely complex. The point was whether gold was essential to our economic system, and, if so, what it was worth in these abnormal times? If it could be shown there was a large profit made on the purchase of gold it would be reasonable to repay a portion of the profit to the producers in order to stimulate the output. It was most important that the Empire's gold should continue to reach the London market, but to ensure this a systematic investigation was absolutely necessary.

\* \* \* \*

The paper which Mr. Hugh F. Marriott recently read before the Institution of Mining and Metallurgy

**Rand Gold Values at Depth.** was briefly reviewed in our last issue.

Particularly instructive is that part of the address which deals with the variation in gold values in depth. Mr. Marriott's conclusion, based on the exhaustive data which he gives in tables, plans, and a large coloured diagram depicting the assay results of the Central Rand mine workings from outcrop to the depth attained at the end of 1916, is that there is no general indication of depreciation of gold values in depth. The following are Mr. Marriott's figures of the averages of all Main Reef Leader developments on the Central Witwatersrand mines, measuring 40,000 feet on the strike of the reef, from Crown Mines on the west to Nourse Mines on the east side:—

Distance on Dip. Feet.	Average Value. Shillings.
0 to 1,500	44.66
1,500 to 3,000	31.69
3,000 to 4,500	37.067
4,500 to 6,000	32.432
6,000 to 7,500	29.817
7,500 to 9,000	30.606
<hr/>	
Total average	34.192
Average excluding outcrop zone	32.222

That the outcrop zone records a considerably higher average gold content than the remainder Mr. Marriott considers natural, inasmuch as it includes the results of secondary enrichment. If the outcrop zone is omitted, however, the average gold content of the Main Reef Leader on the Central Witwatersrand comes out at 32.22s. per mine ton; in comparison with which the uppermost zone shows 31.19s. and the sixth, or lowest, zone in depth, 30.6s.—“a remarkable degree of approximation when it is noted that they are separated by nearly a mile of workings on the dip.” The fact that the gold yield per ton milled by the mines in recent years has been very considerably less than in early days is, Mr. Marriott point out, very largely the result of substantial reduction in working costs permitting low-grade ore to be milled which previously had to be left *in situ*. Mr. Marriott's final conclusion is interesting. He says, “We can leave the future to bring what it may, fully assured that behind the average returns of the mines which represent the practice of to-day, there exists a reserve force in the continuance of high-grade ore at great depths, which, while it brightens the speculative outlook of the mines more directly concerned, may be counted upon to uphold the reputation of the Rand goldfields for a long time to come.”

\* \* \* \*

A full report of the important speech delivered at the Crown Mines meeting by Mr. Samuel Evans

**The Health of Mine Natives.** appeared in a recent issue. As usual, health questions bulked largely in the chairman's review. He showed that the health of the company's employees continued to improve. Deaths from disease in 1917 were: For European employees, 3.4 per 1,000, and for coloured workers, 8.0 per 1,000, both

being records. He said that the recent results confirmed the hopeful anticipations announced at last year's meeting as to the success of Dr. Lister's anti-pneumococcic vaccine, and justified the belief that in a short time pneumonia would be practically eradicated as far as the mine natives were concerned. He declared that the greatest of the health problems at present was tuberculosis, not because of the extent to which it affected mine natives, which was not great, but because it was a prime cause of the high mortality of miners' phthisis amongst the European underground workers. The mines alone could not do much more than was being done to combat tuberculosis, and as it was their efforts were partly wasted, because there was no effective means of preventing natives not in the employ of the mines from trailing infection about. Tuberculosis appeared to be spreading in most of the areas from which natives were recruited for mine work and other work in the labour districts. Mr. Evans made the following important recommendations: (1) It is of primary importance that funds should be provided to enable the South African Institute for Medical Research to undertake research work in tuberculosis. There are facilities here for such research work which are not to be found elsewhere. (2) Provision should be made for the initial and periodical medical examination of all coloured applicants for employment in domestic and other service on the Witwatersrand on lines similar to those established in connection with mine labourers. Employers should be prohibited from taking into their service any native or coloured person who is not in the possession of a certificate not more than four weeks old, from some competent authority showing that he or she is not a typhoid carrier and is free from tuberculosis and other communicable diseases. (3) The Union Government should undertake the provision of adequate and separate hospital and sanatorium accommodation for the segregation, treatment and care of all Kaffirs, coloured persons and poor whites suffering from tuberculosis, who are at present a menace to public health.

\* \* \* \*

The Director of the U.S.A. Department of Mines has issued the following statement: “The ultimate

**Lessons for the Union.** success of our country in the present world-wide catastrophe depends very greatly upon the intelligent prospector and upon the metal-mining industry as a whole. For our own use in this war we need manganese, chromium, pyrite, sulphur and the other miscellaneous metals. Manganese and ferro-manganese are essential for all steel production. Without chromium and nickel it is impossible to make the highest quality of linings for our cannon. Sulphur and pyrite are the basic supply of sulphuric acid required to make all explosives. At the present time this country is sadly deficient in these materials. By far the larger portion of them is imported. Yet all of them occur within our borders, and investigation and experimental work would doubtless render them available and make this country independent of all outside source. So long as any of these essentials must be obtained from foreign sources, the United States will be to that extent dependent. The country should be able not only to manufacture munitions of war in great quantities, but also munitions of the highest quality. It is not sufficient that we have armoured vessels; their armour must equal, or be superior to, the armour of the vessels of the enemy. It is not sufficient that we have guns equal in size and range to those of the enemy; they must also be equal, or superior, in the quality of the material from which they are made, in order that they may not fail when most needed. It is not sufficient that we have an amount of ammunition equal to, or greater than, that of the enemy; it must also equal or surpass the enemy ammunition in effective explosive power. Back of the number of men we put into the field must be material of the highest quality in every respect. The United States has enormous deposits of iron ore, and of coal with which to smelt it. So far as the supply of iron is concerned, our Government need not look outside its boundaries; but sight should not be lost of the all important fact that we do not now produce nearly enough nickel, manganese, or chromium.”

To conserve the huge store of gold in the United States lately drawn upon rather heavily by  
**U.S. Gold Exports.** Japan, Mexico, and Spain, President Wilson has placed an embargo on the exportation of coin, bullion, and currency.

This applies to all nations, and became effective last September. The control of gold exports is placed in the hands of the Secretary of the Treasury and of the Federal Reserve Board. The former is authorised to license such exports where, in the opinion of the latter, they are not harmful to the public interest. The stock of gold in America is about £600,000,000, about 40 per cent. of which has been imported since January, 1915. The trend of gold has, however, been distinctly away from the United States recently.

\* \* \* \*

The comparatively young Institute of Metals—it is but little more than ten years old—is to be congratulated on the success and standing which it has already achieved. Dr. H.

**Institute of Metals.** C. H. Carpenter, F.R.S., etc. (Professor of Metallurgy at the Royal School of Mines), in his Presidential address at the recent annual meeting paid a tribute to those fellow-founders who have worked so hard to establish it. The following are some *obiter dicta* culled from his address (which has just been reprinted in pamphlet form): "Non-ferrous metallurgy may be divided into two main parts which are quite distinct and well defined. One begins where the other ends. The first may be described as ore treatment, and its field of operations is the extraction of metals from their ores. In other words, it is smelting. It may conveniently be regarded as having fulfilled its function when a marketable metal or alloy has been produced. With this side of metallurgy we, as an institute, are not concerned. It is the province of our elder brother—or is it sister?—the Institute of Mining and Metallurgy. The second includes the working up of the raw merchantable products of the first by mechanical processes into a variety of finished materials, the founding of alloys, their mechanical and heat treatment, etc. On the whole, while I do not think that there is any generally accepted designation for work of this somewhat composite character, the term metallurgical engineering seems to me to encompass it with sufficient accuracy. This is the province which we, as an institute, have entered into and done our best to possess. We are, in fact, the youngest of the engineering societies."—"As yet we [and the United States] are the only two countries who support a technical institute devoted solely to the study of non-ferrous metals and alloys."—"The position of copper is being seriously challenged by aluminium and its alloys in many practical applications."—"Our investigators are engaged in the fundamental task of laying the foundations of a theory of corrosion [of brass marine condenser tubes by salt water] which shall be in harmony with, and as far as possible explain, all the observed facts, and thus lead up to the practical solution. It has turned out to be a case of 'the longest way round is the shortest way there.'—"Pasteur's words on his seventieth birthday "have been more helpful to me in my scientific and technical work than any others I can call to mind: 'Cultivate the spirit of criticism. By itself it is neither a generator of ideas nor a stimulus to great things. Without it nothing will avail. With it will always remain the last word.'—"The fact that the view is held in many works that the only thing a metallurgist who comes to them from a technical college or university can do is to analyse—and not always that—is a well-justified criticism."—"Some of the leading works of so eminently practical a nation as the United States have recognised not only the importance but the necessity of establishing laboratories . . . where the theoretical basis of each works' operations is investigated more fundamentally than can be done even in a university or technical school and where no practical results are looked for under a period of from five to ten years."

## TOPICS OF THE WEEK.

### THE NATIONAL BANK MEETING.

For many reasons the chairman's speech at the annual meeting of the National Bank was this year of unusual interest and significance. No one is in a better position to judge the cumulative effects of four years of war on the trade and industries of South Africa, and it is most satisfactory that the position of the Bank as well as the position of the country should be shown to be so sound. A full report of Mr. Crawford's speech from the chair appears in this issue, from which it will be seen that the finances of the Bank have, in a most difficult year, to use the chairman's own words, gone on from strength to strength. Moreover, despite a shortage of staff, the Bank continues to pursue a policy of territorial expansion, the latest manifestation of which is the taking over of the valuable connection in Central East Africa of the African Lakes Corporation. Mr. Crawford's review of the business of the country covered every phase of commerce and industry from mining to agriculture, and laid special emphasis on the marvellous growth of local industries since the beginning of the war. Like most business men he showed himself a little impatient at the deluge of politics which is allowed to obstruct the industrial progress of the country. For this, of course—though Mr. Crawford could not say it—the Nationalists are responsible, and it would be a good thing for the advancement of the country, if these gentry would concentrate on increasing their profits and production. "To sum up," said Mr. Crawford, "South Africa has immense resources with which to supply her internal needs and to play a large part in meeting the world's hunger for raw material, but without the properly directed activity of man this natural wealth will avail her little." Mr. Crawford paid a handsome tribute to the work of the various Government departments that have been promoting industries, and it is all to the good that the head and spokesman of a great financial institution that can do so much for our industries by extending to them the necessary credit facilities, should give public expression to his belief in their future. Controversial questions, such as labour matters and the bank charges for the realisation of the gold output, Mr. Crawford doubtless wisely ignored. He had, however, a timely word of warning to offer in regard to the business outlook. He said: "Without shedding one iota of confidence in our ultimate future, I would enjoin upon people the desirability of conserving their extraordinary profits and of husbanding their resources in order that they may have a reserve to tide over leaner years which may intervene between the resumption of more normal conditions and the fuller development of the country. I will not, I think, lay myself open to a charge of pessimism if I express the fear that those who do not make preparation against this reaction may have disappointments to meet." Much the same thing was said in different words by the chairman of the Capetown Chamber of Commerce at the annual meeting of that body the other day, when he declared: "No one can foretell what the future has in store, nor what the ultimate effect of the great happenings in Europe will be. We can but rest thankful that South Africa has so far emerged somewhat ingloriously comfortable from the great world upheaval, and hope that her luck will see her through." As Mr. Crawford well put it in another part of his speech, "South Africa is fortunate in that it can produce commodities vitally necessary to the Empire and its Allies. For the present our producers and merchants are enjoying an era of unique prosperity, a good deal of which, it should be admitted, is due to the abnormal conditions of the times." Like the chairman of the Standard Bank, the chairman of the National Bank plainly is a believer in the wisdom of talking up the credit of the country, tempering his tribute with a warning against over-confidence. Mr. Crawford's cautious and well-reasoned review will therefore be read with pride and satisfaction throughout South Africa, and will be welcomed overseas by all friends and well-wishers of this country.

## THE BASE AND RARE METALS OF THE UNION.

[By T. G. TREVOR, A.R.S.M., F.G.S., Inspector of Mines, Pretoria.]\*

THE exploitation of the mineral resources of South Africa has been of such recent growth, and the expansion of the gold, diamond and coal industries has been so rapid and so profitable, that nearly all the available capital had been devoted to those industries, and in the past it has usually been only as a matter of accident that the presence of other minerals has been recorded. In the last ten years, however, the profitable exploitation of the tin mines and of the Messina Copper Mine has turned more attention to the question of base and rare metals, and though as yet very little capital has been spent on the exploitation of these, there is every reason to hope that they occur in sufficient quantities to become a permanent source of riches to the country.

**Antimony.**—This occurs as antimonite in the gold reefs of the northern line of the Murchison Range in the Zoutpansberg district of the Transvaal, in a very pronounced contact zone. The reefs extend for some thirty miles. They are to a certain extent lenticular, but occurring again and again on the same horizon, and being up to 20 ft. in width, make workable masses of ore, which have been developed down to a depth of 200 ft. The ore contains from 6 per cent. to 60 per cent. antimonite, and from 3 dwts. to 1 oz. of gold to the ton. Formerly the antimony was regarded as worthless, and as preventing the working of the gold. Recently a railway has penetrated the neighbourhood, which is only some 200 miles from the port of Delagoa Bay, and a considerable quantity of hand picked antimonite has been exported, and attempts are being made—which in time will doubtless be successful—to establish a local treatment of the ore, both for the antimony and for the gold it contains. Antimonite also occurs, and has been opened, showing a workable mass of ore, in the Steynsdorp division of the Barberton district. In 1916, 721·662 tons of antimony ore, valued at £15,292, were sold or shipped, and in the first six months of 1917, 475·8 tons, valued at £9,360.

**Arsenic.**—This occurs as a deleterious impurity in many of the gold mines which are situate in contact belts, and in some of the tin mines. In other of the tin mines it is an essential constituent of the pipe-like chutes which carry the cassiterite. Many tons of massive mispickel have to be mined to obtain the tin, and there is no doubt that a regular supply of many tons per month could be obtained if the demand arose. The Union uses some £80,000 worth of arsenite of soda for sheep and cattle dips annually, and the question of making these in the country from locally produced materials is receiving attention.

**Barium.**—The existence of barytes has been noted in the Transvaal at several points in the Bushveld area, and also at Saltpetre Kop and Spiegel River in the Cape Province, but so far there has been no attention paid to this mineral.

**Bismuth.**—The occurrence of bismuth has been reported in some of the gold ores of the Sabi district, and in one of the tin mines (Stavoren), but neither occurrence is of commercial importance. In 1897 a very rich mass of bismuthite was found on the farm Geweefontein, in the Bushveld granite area of the Transvaal. This mass, which yielded many tons of almost pure mineral, vanished at about 60 ft., and, as at the time there was no knowledge available of the nature of the now well known pipes of this area, work was abandoned. In the light of present knowledge, the occurrence was a pipe, identical with those of the Transvaal tin mines, and work is shortly to be recommenced on it, in the hope of finding the ore body again.

**Chromium.**—For several hundreds of miles along the margin of the Bushveld granite area in the Transvaal, pseudostratified segregations of chromite have been noted. These are several feet in thickness, and of quite workable

size and extent. They have so far not been opened or exploited, but from time to time samples have been assayed. These usually contain from 35 per cent. to 45 per cent. chromic oxide. Samples from the north of the Lydenburg district, however, yield up to 54 per cent. Unfortunately this portion of the country lies over fifty miles from a railway, and is very inaccessible, but a reconnaissance has been made by the Railway Department, and in time the district will be opened and the deposits brought within reach of a market. It is probable that richer ore may also exist in the other portions of the occurrences, for so far only obvious outcrops have been tested, and obvious outcrops of all minerals tend to be the most siliceous, these resisting denudation, where the richer deposits weather away. The richer outcrops therefore become subsurface, and must be sought for by regular prospecting. These chrome ores also contain an appreciable quantity of platinum, and certainly deserve attention.

**Cobalt.**—Cobalt was one of the first minerals to be worked in the Transvaal, an extremely valuable complex ore, which fetched several hundred pounds per ton, being exported from the north Middelburg district in the early eighties of the last century. The deposit occurred in the contact zone of the Bushveld Granite, but owing to its irregularity, the mine soon closed down, and has not been re-opened. Another cobalt deposit, near the railway at Balmoral, was opened in 1906, but at the then price of the mineral was not considered payable.

**Iron.**—There are extremely extensive and obvious deposits of magnetic iron ores connected with the Bushveld Granite Complex and with the older schistous rocks. Unfortunately, these obvious deposits have, when examined, proved to be highly titaniferous, and are of no economic value at the present moment, though in the future they may become so. Also obvious are beds of highly ferruginous sedimentary rocks, which occur in all the older geological formation. In most cases these are far too siliceous for economic smelting at the present day, but with detailed examination, portions of them can be found giving over 50 per cent. metallic iron, a percentage which brings them within reach of the smelter. This is the case at Pretoria, where the majority of the obvious and magnificent looking outcrops are economically useless, but where detailed examination is proving the existence of bodies of ore of workable quality and satisfactory quantity. At Postmasburg, in Griqualand West, in the same geological formation, huge masses of secondary iron ore, derived from these siliceous beds, running up to 54 per cent. metallic iron, are known to exist. These are reported to be up to 40 feet in thickness and many miles in length, but owing to the distance from a railway and the sparse population of the district, they have not yet been investigated. Up to recently there has been no demand for iron ore in the country, so nothing but the most obvious outcrops were noted, and these were usually not investigated. Of late, however, some tentative inquiries have been made, and from the samples sent in and the information afforded, it seems certain that, though there are, in the inhabited districts, no obvious deposits of great magnitude and rich ore, such as might be said to demand the immediate establishment of an iron industry, yet there are unsuspected deposits of workable ore all over the country, which, in the aggregate, should be sufficient for all the requirements of the country.

**Lead.**—Before the introduction of breach-loading arms and fixed ammunition, lead for bullets was smelted in the Transvaal, but the introduction of fixed ammunition killed that embryo industry. Later, in 1892, an argentiferous galena was mined, and smelting works were erected, near the present railway station of Argent, some fifty miles east of Johannesburg. The deposit in the mine, which was of the fissure vein nature, was very satisfactory, but the

\* In the Official Year Book of the Union.

amount of water met could not be dealt with, and the mine eventually shut down at a loss. About the same time a promising lode of galena was opened at Waterval Onder, but beyond opening the lode, no further work was done. Through the whole dolomite area of the Transvaal, galena occurs in irregular deposits. These deposits are occasionally worked and the galena sold to the ore reduction companies on the Rand, but there is no steady output of galena, nor has any endeavour been made so far to establish one, save the premature attempt in Argent in 1892, mentioned above. Galena also occurs in fissure veins in the north of the Transvaal, in Natal, and other parts of the Union, but no attention has been so far directed to it.

**Mercury.**—Traces of native mercury have been reported from various parts of the country, but most of these are probably due to accidental salting. In the Barberton district, cinnabar occurs in the contact zone between the sedimentary formation, and the granite that is intrusive in it. The quantity of cinnabar in the ore (an altered quartzite) appears almost payable. The claims containing the deposit have been held for years, and a good deal of money spent in developing them, but so far no attempt actually to extract the mercury has been made.

**Manganese.**—Manganiferous earth of inferior quality is of frequent occurrence. Pyrolusite of good grade occurs in the form of veins in the older rocks of the Cape Province, and in the neighbourhood of Pretoria, but the veins are in all cases small and much mixed with gangue. At the present time a few tons per month are being mined at Pretoria for use in the cyanide works of the Rand, but otherwise no commercial attention is being paid to the mineral.

**Molybdenum.**—This occurs in Natal as molybdenite, and in the northern Transvaal, and in the copper mines of Namaqualand. In no case has its occurrence yet proved of commercial importance. It occurs disseminated through pegmatitic veins in the granites and gneiss, and also in the tin pipes of the Bushveld area. So far this mineral has not been sought, and it is quite possible that payable deposits may be found, if attention were directed to it.

**Nickel.**—The occurrence of nickel has been noted in many parts of the Transvaal Bushveld Complex, and at Insizwa, in the Cape Province. One irregular deposit containing a fair percentage of the metal, together with copper ore, has been opened in the Rustenburg district, with what are said to be satisfactory results, though the mine has not yet got beyond the prospecting stage.

**Platinum, etc.**—The occurrence of platinum and the allied group of metals in the black sands derived from the conglomerates of the Klerksdorp area has been noted. The quantity appears to make the occurrence worthy of attention, but so far nothing has been done. In the chromite deposits the presence of platinum in more than traces has also been proved. It also occurs in the Insizwa nickel ores.

**Silver.**—The only silver won in the country is that contained in the gold bullion, of which it forms about 10 per cent. by weight. Two lodes of argentiferous copper ores have been worked in the past—the Willows Silver Mine, near Pretoria, and the Alberts Silver Mine, near Bronkhorstspruit. The working of neither was attended with success, possibly because attempted in the days before railway communications were established and when all working costs were high.

**Sulphur.**—There are no sulphur deposits of anything but scientific interest in the country, nor are any large deposits of massive pyrites known, though the occurrence at Areachap in the Cape, near Upington, may prove to be such on further development. There are, however, many gossan outcrops in all the older formations of the country, which have not been opened, and which may lead to sulphide deposits of magnitude, and practically all the gold ores of the country contain from 5 per cent. to 35 per cent. of pyrites. This may in future become the sulphur supply of the country, as this pyrite is obtained as a by-product in the production of gold. Unfortunately, up to the present the kilns of the explosive factories, where sulphuric acid is made, have been adapted either to sulphur or to imported

massive pyrites, not to fines, and a great difficulty is being experienced in introducing the latter. Up to June, 1917, 8,337 tons of pyrites have been won, partly as massive pyrites from Areachap, but mostly as concentrates from a tailings dump of a gold mine on the Black Reef near Johannesburg.

**Thorium.**—Monazite occurs in many places in more than samples around the margin of the Transvaal Bushveld Complex, as do various other rare minerals; but no attention has so far been paid to these, though the monazite is reported to have very distinct radio-active qualities. The mineral is also found along with cassiterite in the alluvial workings of Swaziland.

**Titanium.**—Hand samples of almost pure rutile have been obtained from the Barberton district, but as yet no information is public as to its method of occurrence. The titaniferous iron ores of the Transvaal already mentioned contain up to 14 per cent. titanium, and occur in enormous quantities.

**Tungsten.**—Specimens of wolframite have been obtained from various localities in the Transvaal, and in the Kuils River tin mine, but no quantity has been discovered. Scheelite occurs in considerable quantities in the Stavoren Tin Mines, and is now being developed, 6.7 tons of scheelite, valued at £1,146, having been exported during the eighteen months ended June, 1917. Some two tons of scheelite were picked up on the surface near Leydsdorp and exported in 1916, but capital has so far been lacking to trace this to its source.

**Vanadium.**—Samples of vanadium have been found associated with the lead ore in the neighbourhood of Pretoria, but this discovery has not been proceeded with.

**Zinc.**—Zinc, like lead, occurs in irregular deposits throughout the dolomite area of the Transvaal, but, with the exception of one property, no attention has been paid to its occurrence. At Witkop, in the Marico district, a zinc mine was opened, and it is said that several thousand tons of blend were developed when the mine shut down, but further details are lacking.

**Radio-Active Minerals.**—So far, pitch blend has not been found in the Union, and, with the partial exception of monazite, no commercial attention has been paid to the rarer radio-active minerals which are found in the neighbourhood of the Swaziland and Transvaal tin fields, and which were described by Dr. A. W. Rogers in a paper read before the Geological Society of South Africa in April, 1914.

### Swaziland Tin.

The following are the results of the operations of this company for the month of May, 1918: Concentrate recovered, 35.85 long tons; estimated profit (taking tin at £275 per ton), £2,461; adjustments in respect of previous shipments, £1,380; total estimated profit, £3,841.

### Zaaiplaats Tin.

The Zaaiplaats results for the month of June, 1918, are as follows:—Days run, 25; concentrates won, 50 long tons; estimated profit for the month, excluding Government taxes and directors' fees, £8,581 13s.; capital expenditure, £232 3s. 6d. A dividend at the rate of 30 per cent., or 1s. 6d. per share, has been declared.

The "Reminiscences" of Mr. E. T. McCarthy, a Vice-President of the Institution of Mining and Metallurgy, are now in the printers' hands. Any profits arising from the book are to be given to the St. Dunstan's Home for the Blind. Mr. McCarthy's reminiscences of forty years' practice as a mining engineer in America, Africa and the Far East would fill many books, let alone one.

## THE ADVENT OF THE IRON AGE IN SOUTH AFRICA.

### A Start at Vereeniging and Pretoria—The Beginnings of a Great Industry.

In a few days' time pig iron will be produced at Vereeniging and Pretoria, and in a few years' time, it is anticipated that no part of a mine battery will be imported into this country. The ore from which the pig will be produced at Vereeniging comes from Kromdraai, and the Pretoria furnace is, of course, using ore from the extensive, if low-grade, deposits on the Pretoria town lands. Four essentials are commonly said to go to the making of an iron industry. These are ore, flux, fuel and a market. In the case of Vereeniging and Pretoria these factors are, up to a point, all present. South Africa is full of iron ores—the laboratory at Vereeniging has already had over 800 specimens from different deposits submitted to it from all over the country. Fluxes and fuel are available in abundance, the Vereeniging works having contracted for the supply of an excellent coke from the Vryheid district. The market, of course, is limited during the war to South Africa; but is big enough to support a fair-sized industry. The Pretoria iron works aim to deal mainly with the town lands deposits, but the Vereeniging people have adopted a different policy. Their decision to instal a blast furnace at Vereeniging was based largely on the fact that an industrial atmosphere had already been created by the Vaal; and with cheap coal and water available, a beginning might there be most suitably made. Ores from all over the country will be tested; and it is the intention, when ore suitable both in quality and quantity is discovered, to erect the larger and more permanent works in the immediate neighbourhood of that deposit, wherever it may be. The wisdom of that policy is obvious. As soon as we are in a position to announce the successful production of the first few tons of pig iron in South Africa we shall have something further to say on this all-important subject. In the meanwhile we note that the *Cape Times* recalls that it is ten years ago since Sir M. E. Kotzé, the Government Mining Engineer, presented his report on the prospects of establishing such an industry. At that time it was at least doubtful whether all the raw materials required could be found in sufficient quantity and quality within our own borders. Partly as a result of the Kotzé report, an industry for the conversion of scrap-iron into good steel was initiated at Vereeniging, and the company which is now operating is able to turn out about 1,200 tons a month of manufactured articles in the form of rails and bars and even shoes and dies, thereby relieving on quite a considerable scale the shortage in such goods compelled by the restrictions on shipping. But obviously a scrap-iron industry must be very limited in its scope, and the future of an iron and steel industry in the Union must depend upon the production of the raw materials in South Africa. As regards iron ore, a good deal of research work has been carried out since the Kotzé report was presented, and the Dominions Royal Commission, in its final report last year on the resources of the Dominions, stated, in a brief survey of iron deposits in South Africa, that the Transvaal deposits are "enormous in quantity and very various in quality." As Dr. Wagner points out, much of the Transvaal ore is, unfortunately, impregnated with a very high percentage of titanium, and is consequently refractory and unsuitable for reduction in a blast furnace, though recent investigations in Canada and in South Africa mentioned by Professor G. H. Stanley in his exhaustive review of iron and steel prospects in South Africa, suggest that these difficulties are by no means insuperable. But even if the titanium ores prove unworkable, there are large lodes of very excellent quality from forty to fifty miles north of Pretoria which are undoubtedly workable. "There is enough," says the Royal Commission, "in various parts of the Union of the very finest quality . . . to deserve the immediate and earnest consideration of British manufacturers who regard with anxiety the prospective exhaustion of the high class ores in Spain. . . . We venture to suggest that it would be worth while for consumers in Great Britain to ship enough of the ores to ensure

adequate and exhaustive trials, and, should these prove satisfactory, they might then consider the expediency of erecting blast furnaces and ship home the pig iron produced." We may take it then, that the supplies of the primary raw material will be practically inexhaustible, more particularly if it should prove feasible to mix the silicious ores on the Pretoria town lands with the titaniferous ores already mentioned. Good ores of a quality to justify detailed investigation have also been found in the neighbourhood of Maritzburg and in the I'rieska and Kuruman districts of the Cape. The second problem is as to the available supplies of coke-making coal. As regards limestone for fluxes, there is every reason to suppose that suitable material can be found in abundance, often in close proximity to the most promising iron deposits. We have therefore the general position that the raw materials are to be found in South Africa, and we have the evidence of such well-qualified judges as Dr. Stanley and Dr. Wagner that the conditions are favourable for the establishment of a flourishing industry. In the early stages, at any rate, such an industry must mainly depend upon the local market for its success. Ten years ago Mr. Kotzé estimated that the plant for a blast furnace and rolling mills capable of producing 55,000 tons per annum, would cost about a quarter of a million sterling, and he calculated that the Transvaal alone would consume 35,000 tons\* of the iron produced, leaving 20,000 tons for absorption in the rest of South Africa. The chief products of such a plant would be pig-iron rails, bar and ingot steel and iron, plate and sheet iron and steel, and perhaps fencing material. Since he wrote, South African ironworks have actually produced shoes and dies on a considerable scale, as well as rock drills; and Dr. Stanley places the local market for iron and steel products which might easily be manufactured in South Africa at 75,000 tons a year, which would considerably exceed a million sterling in value. Whether the export of pig iron would be commercially practicable is more doubtful. If present world-prices were maintained for some years after the war they would certainly justify local development on a large scale, and it need scarcely be said that a well-established iron industry in South Africa, even on the comparatively modest basis which has hitherto been thought of, would be of vast importance to the Union, not only as a permanent asset in itself, but as the focus of almost innumerable subsidiary industries—perhaps even a shipbuilding industry—which ensure an inflow of the best type of immigrant, and open an ever-widening market to the produce of our farmers.

Considerably improved results are shown in the accounts of the African City Properties Trust for the **African City** past year. The profit was nearly doubled, **Properties Trust.** rising from £14,903 to £29,477, and the available balance increased from £25,442 to £39,156. After paying debenture interest and preference dividend, amounting to £10,000 and £7,500 respectively, it is proposed to raise the ordinary dividend from 3½ to 5 per cent., the rate for 1915 having been 2½ per cent., leaving an undivided balance of £10,640, or nearly £1,000 more than a year ago. The report states that there was a considerable influx of population to Johannesburg last year, which, combined with the satisfactory business conditions that prevailed, created a demand for business premises and house accommodation. The company's Johannesburg manager writes that the steady progress of the town as a distributing centre continues, and existing values of real estate will, in his opinion, be maintained. Since the close of the accounts £75,000 of the company's debentures have been purchased at a discount and cancelled, reducing the debentures outstanding to £175,000.

## MR. C. B. HORWOOD ON RAND GOLD DEPOSITS.

[Review by J. F. KEMP.]

*The Gold Deposits of the Rand.* By C. Baring Horwood. 8vo, pp. xviii., 400, figs. London, Charles Griffin and Company, 1917.

Mr. Horwood's book opens with a foreword from Mr. T. A. Rickard. The foreword is followed by a preface and an introduction from the author himself. The introduction summarized the three views which have prevailed regarding the entrance of the gold and pyrite into the Rand conglomerate. These are, first, the sea-beach placer; second, the sea-beach placer followed by re-solution and re-deposition; third, the introduction of the gold and pyrite from below, according to the most trusted views on the formation of lodes. The author is a firm believer in the third method and his great object is to establish this thesis. The chief gold-bearing bed is the Main Reef Leader and next to it, in importance, but less uniform in values, is the South Reef Leader. The Main Reef itself is low-grade, usually 2-4 dwts. per ton, and is commonly 4-12 feet thick. The Middle Reef contains a few dwts. and is stoned with the South Reef Leader; but the Hanging Wall Reef is for the most part left behind. (These details are taken from pp. 194-196.) Thus the mines have two lodes, the Main Reef Leader and the South Reef Leader, separated in the run of practice by from 40-120 feet of quartzite. Structurally the Witwatersrand system forms a great syncline with a major axis running north-east and over fifty miles long. The conglomerates are mined along the northern rim and with a southern dip. At the east and west ends of the syncline the beds bend around to the south and the productive conglomerates on the east have been treated by borings where covered by the overlying Black Reef and Dolomite series. Throughout the mining districts great dykes of diabase with parallel strike to the productive series have come up along strike faults. They are of various widths up to 400 feet. Cross dykes in the general direction of the dip are also known. Faults are likewise important features of the structure. The dykes indicate a great, deep-seated mass of igneous rock, originally their source. The author in Chapter II. takes up the "Pyrite Replacements," because it is obvious if replacement can be shown, the introduction of the pyrite and its contained gold has taken place from an outside source. For many years past the existence in the bankets of rounded masses of pyrite known as "pyrite pebbles" has been a matter of observation and record. The advocates of the placer hypothesis considered them water-worn survivors of ancient sea-beach conditions. Our author, however, by means of microscopic study of thin sections clearly demonstrates that they are due to the replacement of original pebbles of quartzite and vein-quartz: of the matrix of the conglomerates and sometimes of both pebble and matrix in the same pyrite spheroid. The replacement of an original pebble may be but partial, leaving a core of the original; or may be indicated by unplaced fragments which survive in the pyrite. In fact, after weighing the evidence, no candid reader can fail to conclude that the replacement advocated by the author is soundly established. The same subject is continued in Chapter III., with a theoretical and extended discussion of the physics and chemistry of the process; involving as it does at times concretionary and radiating structures. Many interesting points are brought out. The author is alive to the possibility of high temperatures which may have prevailed at the time

of precipitation. On pp. 65-67 the shape and growth of the pyrite pebbles are discussed. They are predominantly spheroidal and ellipsoidal and in this feature preserve the shapes of the replaced pebbles. The elongation is along the dip, leading to the inference that the solutions circulated most freely up the dip. The effect of the dissolving part of the process on angularities would be to smooth them down, because solution is believed to act more vigorously the greater the pressure. Obstacles in the way of free flow would tend to be dissolved and removed. Presumably, also, those portions of the pebbles which lay across the stratification, which is the line of flow, would stand the best chance of solution and replacement, while the flat sides in the planes of stratification would let the solutions pass by with greater ease. In a footnote to p. 67 the author takes the opposite view to the above statement, and seems to the reviewer to have fallen into a contradiction to the general principles. In the discussion of the association of gold and pyrite, the author considers the possibility of eutectic solutions of the two, and even of eutectic gases. If in excess, the pyrite would be precipitated alone until the eutectic point was reached, when both would crystallize together, a suggestion over which all students of the gold-quartz veins may well ponder. In Chapter IV. the author discusses the carbon in the bankets, a subject on which he has written at length in earlier papers. The carbon appears in small, rounded and irregular masses, resembling dull graphite and is often associated with rich ore. Its dissemination is so fine and its mixture so intimate that satisfactory samples for analysis are not easy to obtain. From 15 lbs. of ore (p. 96) by fine crushing so as to pass a 90-mesh sieve, 19 grams of 0.54 per cent. carbon were obtained. From 45 lbs., by crushing, sliming in water, skimming and purifying with dilute nitric acid, 1.5 grams containing 16.5 per cent. carbon were obtained. Sir H. A. Miers tested another sample and could find little except carbon, associated with a sulphur (and arsenic) compound, probably of iron. The carbon mineral was not believed to be a hydrocarbon. From a coarser sample which could be separated by hand, Mr. Horwood obtained 3 grams of hardness between 2 and 3, sp. gr. 1.70; 49 per cent. carbon. Destructive distillation gave traces of oil, thereby proving the presence of hydrogen, not combined in water. The carbon mineral was scaly, flaky, and had experienced shearing. A different specimen gave similar results. From the central portion of two diabase dykes (p. 91), respectively 1,050 and 2,090 feet below the surface, fresh, undecomposed samples yielded to quantitative analysis, in addition to the usual components, carbon 0.22 per cent. and 0.04 per cent. Again from a diamond drill core of a dyke 230 feet thick, and at 114 feet from the edge, a sample of somewhat decomposed rock was taken and analysed. Besides the usual components, 0.03 per cent. carbon was found. Another sample gave 0.2 per cent. These determinations, unusual as they are, are of great scientific interest.\* Mr. Horwood concludes that the carbon is derived from the deep-seated, diabasic magma, and that it has entered the bankets as has the gold, pyrite, quartz, and some minor associates, as an igneous emission. He reviews practically all the recent work on graphite in support of his view.

(To be continued.)

### Glynn's Lydenburg.

The following are the particulars of this company's output for the month of June, 1918:—Tons crushed, 3,812; yielding 1,622 fine ozs.; estimated value of month's output, £7,320; estimated profit for the month, £2,346. Profit includes proceeds of by-products, £550.

Glynn's Lydenburg have declared a dividend of 7½ per cent., or 1s. 6d. per share, for the period ending July 31.

\*They recall the determinations of small percentages of carbon by W. F. Hillebrand in Adirondack gabbros and titaniferous iron ores, as recorded in the paper in the 19th Ann. Rep. U. S. Geol. Surv., Part III., pp. 377-422, 1898.

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## THE WEEK IN THE SHAREMARKET.

## Continued Dulness and Restricted Business.

THE market seemed inclined to go better on Saturday morning, but again business was extremely restricted. Van Ryn Deep, however, are evidently out of favour, and the same may be said also of Brakpans and Modder Easts. Kleinfonteins had a further rise and Consolidated Lands gained another shilling. Once again the same monotonous return of "nothing doing" on Monday morning. Dealings in only seven stocks, returning brokerage for the whole Exchange of under £6. A sixpenny advance in Van Ryn Deep and one of threepence in Kleinfonteins marked the only alteration in prices at the call. The volume of business at the call on Tuesday was double that of Monday. The Modder stocks, with the exception of Modder East, were decidedly better. In the smaller concerns, Kleinfonteins and Main Reefs both showed advances. Van Ryn Deep were weaker. It is almost impossible to find out the true reason of the present unpopularity of this once favoured security. Anyway there is reason to believe that a good many holders, outside of the market, have realised their shares and transferred into Modders and Government Areas. The slight spurt in business indicated on the previous day was not maintained on Wednesday, the market falling back into its, at present, chronic state of apathy. Only two important stocks were dealt in, viz., Government Areas and Springs, the few remaining transactions being all under par. Before lunch there were sales of Modder Bs. at £7 15s. 6d.; Brakpans, 74s. 6d.; New Modders, £23 7s. 6d.; and Kleinfonteins, 11s., a drop of 9d. since the call. Other stocks were firm. The cheering news from the front brought no improvement on Thursday morning, the only appreciable change being a fall of 6d. in Springs. Hume Pipes were officially quoted for the first time with a quotation of 33s., 36s. The following represents the dealings in outside stocks for the week:—Sales: Compound Diamonds, 3s. 3d.; South Van Ryns, 12s. 6d.; Invictas, 21s. 6d. odd lots; Alkalies, 42s. 6d. to 40s., and sales of odd lots at 47s.; Sakalavas, 9s. odd lots; Union Tins, 4s. 6d.; Phoenix, 10d.; New Farms, 1s. 10d.; Henderson Estates, 5s.; Hume Pipes, 36s. Buyers and sellers: Henderson's Options, 10d., buyer.

The following are the alterations in prices on Friday morning:—Sales: African Farms, 9s. 6d. and 9s. 9d.; Geduld Props, 36s. 6d.; Lydenburg Farms, 8s. 7d.; Laces, 10s. 2d.; Modder East four-year Options, 6s. 8d.; Kleinfonteins, 11s. 1d. and 11s. ex London; Springs, 6s. 3d.; and Van Ryn Deep, 65s. 3d. Buyers and sellers: Bush Tins, 8d.; Leeuwpoorts, 23s. 6d., 24s.; Modder Bs., £7 6s. 6d., £7 8s. 6d.; Modder Deep, £6 14s. 6d., £6 17s. 6d.; Modder Easts, 17s. 6d., 17s. 9d.; New Eras, 9s. 9d., 10s.; Pretoria Cements, £6 7s., buyer; Rose Deep, 21s., seller.

	Fri.	Sat.	Mon.	Tues.	Wed.	Thurs.
	July 12.	13.	15.	16.	17.	18.
African Farms . .	9 6*	9 6	9 0	9 0*	9 1*	9 0*
Anglo-Amer. Corp. . .	32 0*	—	32 0*	32 0†	32 6*	33 0*
Apex Mines . . .	7 0*	7 0*	7 6†	7 6†	—	—
Aurora Wests . . .	—	—	9 0*	—	10 0†	10 0†
Bantje Cons. . .	2 9*	3 0*	2 10*	2 10*	2 9*	—
Brakpan Mines . . .	72 6*	71 0*	72 6*	71 0*	71 0*	—
Breyten Colls. . .	—	10 0*	11 0*	—	11 0*	—
Brick and Pott. . .	3 9*	3 9*	3 9*	—	—	3 9*
Bushveld Tins . . .	0 9†	0 6*	0 6*	0 6*	0 6*	0 8*
Cinderella Cons. . .	4 0†	2 6*	—	—	3 0*	3 0*
City and Sub. . .	9 0*	9 3*	9 3*	9 0*	9 3*	9 3*
City Deep. . .	50 0*	50 0*	50 0*	—	50 0*	—
Clydesdale Colls. . .	16 6*	—	16 6*	16 6*	16 6*	—
Concrete Construc. .	5 9†	5 0*	6 0*	—	6 0*	5 9†
Con. Investments . .	17 6*	17 6*	17 6*	17 6*	17 6*	—
Con. Langlaagte. . .	16 6*	16 6*	17 6†	16 6*	17 6†	16 6*
Con. Main Reefs . .	11 6*	11 6*	12 6*	11 9*	12 0*	12 0*
Con. Mines Sel. . .	25 0†	23 0*	23 9*	23 6*	23 6*	—
Coronation Colls. . .	32 0*	32 0*	32 0*	32 0*	32 0*	32 0*
Coronation Freeholds .	1 1†	1 0*	1 0*	1 0*	1 1*	1 1*
Crown Diamonds. . .	—	3 0*	—	—	—	—
Crown Mines . . .	—	30 0*	30 0*	30 0*	—	30 0*
Daggafontein Mines .	23 0*	23 0*	23 0	22 6*	22 6*	22 6*
Do. Options . . .	5 0*	5 0*	5 0*	5 0*	5 0*	5 6*
East Rand Coals . .	1 11*	1 11*	2 0*	2 0*	2 0*	2 0*
East Rand Deep. . .	0 9*	0 9*	—	0 9*	0 0*	0 0*

\*Buyers. †Sellers. ▲Odd lots. ▲Ex London.

	Fri.	Sat.	Mon.	Tues.	Wed.	Thurs.
	July 12.	13.	15.	16.	17.	18.
E.R. Minings . . .	14 6*	14 6*	14 6*	14 6*	14 6*	14 6*
East Rand Props. . .	2 9*	3 0*	3 4*	3 0*	3 3*	3 1*
East Rand Debs. . .	£57*	£57*	—	£57½*	£57½*	£57½*
Eastern Golds . . .	1 0*	—	1 0	—	1 0*	1 0*
Frank Smith Dias. .	2 9*	2 9*	2 9*	2 9*	2 9*	2 9*
Geduld Props. . .	36 0*	36 0*	36 3*	36 3*	36 3*	36 3*
Glencairns . . .	—	2 0*	2 0†	1 6*	—	1 9†
Glenco Colls. . .	6 3*	—	6 0*	—	—	—
Glynn's Lydenburgs .	—	19 6*	—	—	—	—
Govt. Areas . . .	71 9*	72 1½	72 0	72 0	72 3	72 3
Jhb. Bd. of Ex. . .	—	—	26 0*	26 0*	26 0*	26 0*
Jupiters . . .	3 3*	—	3 0*	3 3*	3 3*	3 3*
Klerksdorp Props. .	2 0*	—	2 0*	2 0*	2 0*	2 0*
Knight Centrals . .	3 3*	3 4*	3 3*	3 4*	3 3*	3 4*
Lace Props. . .	10 4*	10 3*	10 3*	10 4*	10 1*	10 0*
Leeuwpoort Tins . .	22 6*	22 6*	21 9*	22 6*	22 3*	22 6
Lydenburg Farms .	8 10*	8 9*	8 9*	—	8 9*	8 9
Main Reef Wests . .	—	2 3*	—	2 6*	2 6*	2 6*
Meyer and Charl. .	—	—	90 0†	—	—	—
Middlevlei Est. . .	1 0	1 0*	1 0*	1 0*	—	1 0*
Modder B.s . . .	146 6*	146 3*	148 0	146 0*	150 0†	148 0
Modder Deep. . .	30 0*	131 0*	135 0	131 3*	135 0*	136 0
Modder Easts . . .	17 9*	17 6*	17 6*	17 9	17 6*	17 9
Do. Options (3yrs.) .	4 10	4 9*	4 11†	4 10	5 0†	4 10†
Do. Options (4yrs.) .	6 9*	6 6	6 10	6 9*	6 9*	6 9*
Natal Navigation .	18 0*	18 6*	18 6*	—	18 6*	—
National Banks . . .	—	£13 2†	£13 2†	£13 2†	—	£13 2†
New Boksburgs . . .	—	—	1 4†	1 4†	1 4†	—
New Eland Dias. . .	—	20 0*	21 0*	22 0*	21 0*	21 0*
New Era Cons. . .	9 3*	9 3*	9 3*	9 3*	9 3*	9 6*
New Geduld Deep. .	5 6*	5 6*	5 6*	5 6*	5 6*	5 8
New Kleinfonteins .	10 0	10 6	11 6	10 9	11 9	11 3
New Modders . . .	£22 2	£22 2	£22 2†	£22 2*	—	—
New Unifeds . . .	—	—	4 0*	—	4 0*	4 0*
Nigels . . .	4 0*	4 0*	4 6*	—	4 6*	4 9*
Nourse Mines . . .	16 6†	16 6†	16 0*	16 6†	—	17 0†
Premier Prefereds .	150 0†	—	—	150 0†	—	—
Pretoria Cements .	123 0*	125 0†	122 6*	125 0†	125 0*	126 0*
Princess Estates . .	2 0*	2 0*	2 0*	2 0*	2 2	2 0*
Rand Collieries . .	2 6*	2 6*	2 6*	2 6*	2 6*	2 6*
Rand Klips . . .	8 3*	—	8 0†	8 0*	8 0*	—
Rand Nucleus . . .	—	—	1 0*	1 1*	1 0*	—
Rand Select. Corp. .	88 6*	88 6*	88 6*	88 0*	88 0*	88 6*
Randfontein Deep. .	3 0*	—	3 0*	3 10†	—	—
Randfontein Est. . .	11 3*	11 0*	10 0*	12 0†	10 6*	10 6*
Rooibergs . . .	10 9*	10 6*	10 9*	10 9	10 9*	11 0†
Simmer Deep. . .	1 6*	—	—	2 0†	—	2 0†
S.A. Breweries . . .	26 0†	—	—	26 0†	—	—
S.A. Lands . . .	5 7*	5 7*	5 7*	5 8	5 8	5 7
Springs Mines . . .	66 3*	66 6	66 3	66 0*	66 6	66 0
Sub Nigels . . .	23 9	23 6*	23 6*	23 6*	23 6*	23 9A
Transvaal Lands . .	15 0*	16 0	—	—	—	—
Transvaal G.M. Est. .	12 6*	12 6*	12 6*	12 6*	12 6*	12 6*
Van Ryn Deep. . .	66 0*	65 0*	—	65 6*	65 0*	65 0*
Village Deep. . .	16 0†	16 0†	16 0†	16 0†	16 0†	16 0†
Western Rand Est. .	—	—	1 9*	—	1 9*	—
Witwatersrands . .	—	—	22 0†	—	—	—
Wit. Deep. . .	8 9	8 9†	—	8 3*	8 6	—
Wolhuters . . .	3 10*	3 11*	3 11*	3 10*	3 11*	4 0†
Zaaiplaats Tins . . .	17 2*	17 6	17 5	17 4	17 8	17 6
Union 5 per cent. .	£102 2	£102 2*	£102 8*	£102 2	£102 2	£102 2*
New State Areas . .	18 9A	17 10*	18 0	17 10*	17 9*	18 0*

\*Buyers. †Sellers. ▲Odd lots. ▲Ex London.

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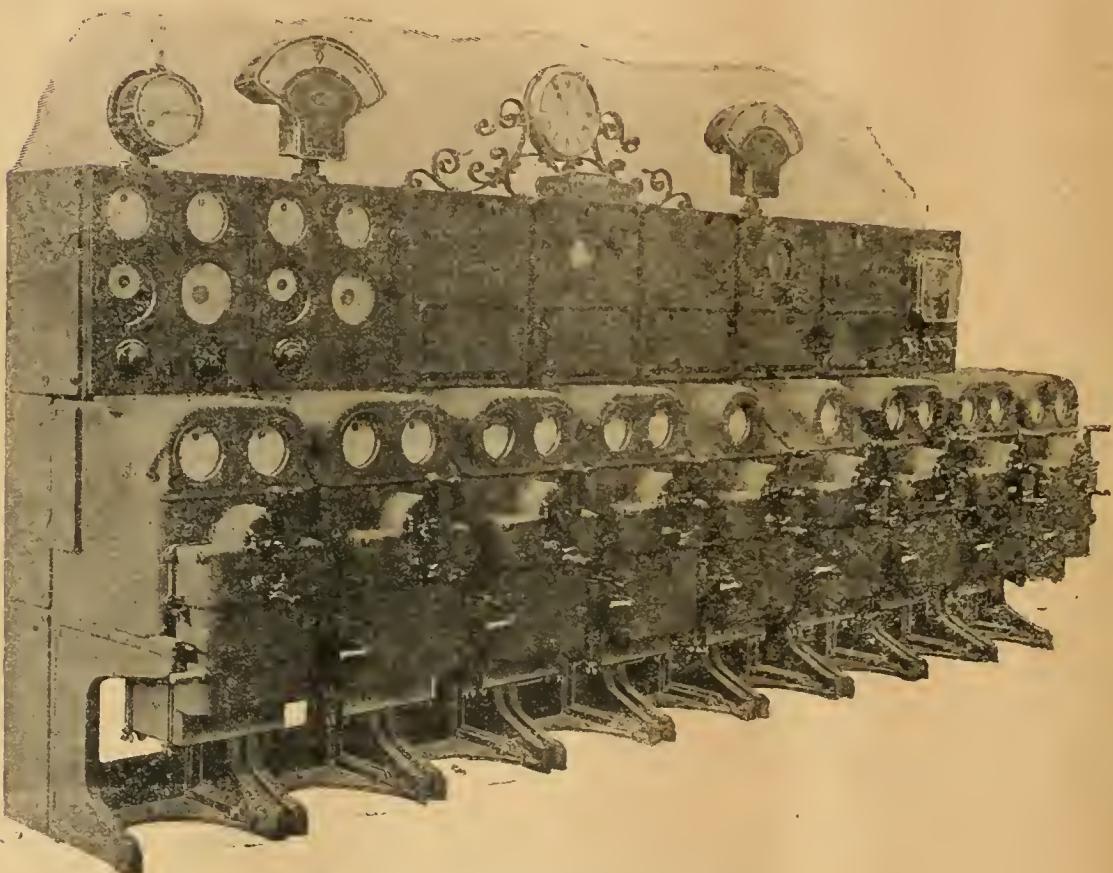
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 CAPE TOWN.—45a, St. George's Street (first floor).  
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## THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

**A Calmer Feeling—Not Out of the Wood—Commercial Exchange Apathetic—Iron Industry—Labour After War—Paraffin Oil Sensation—Plate Glass.**

THERE is a calmer feeling this week as the various matters obtaining towards the unrest are being threshed out by the Magistrates, and Special Commissioner, and although nothing has transpired as to the negotiations between the Chamber of Mines and the Federation of Trades, yet it is all in the melting pot. From an engineer's boss boy at a private yard, it was gathered that he and his boys did not wish to strike. Again in another interview with a white man (Dutchman) who is a miner, he said that he and many of his own people so far as he could ascertain did not wish any bother. Hopes are also entertained in other quarters that things on the mines will be fixed up. However, we are not out of the wood, and this factor is keeping anything like new business or new enterprise in a state of suspense. A merchant remarked that until the veil is lifted as to the future, nothing much can be expected, but he does know that things in Johannesburg when they move move quickly, therefore it becomes business men to act cautiously until the whole position is made clearer. This overhanging cloud partly accounts for business on the Commercial Exchange being so dull and apathetic. But the other reason is that a lot of material has been received from the merchants through the Chief Buyer's Department and is now being delivered, and until that is finished new orders must of necessity be on the poor side.

### THE IRON AND STEEL POSITION.

A telegram was seen from a coast port asking for a quantity of iron, either imported or South African. Unfavourable answer had to be sent because of the scarcity generally and the absence of some special lines required. These enquiries from the coast go to show that prices are of little consequence when the right material can be had to fix up a job in hand, mostly shipping breakages and repairs. Another factor not to be overlooked is the scarcity of iron and steel, therefore it was not surprising that the conversation this week has been monopolised by the fact that the Pretoria iron works have made a start with their blast furnace. An expert who came from a village where nothing but pig-iron was made is hopeful for the ultimate success of the Pretoria undertaking. However, in the initial stages not too much must be expected, as it is a new furnace, and as a rule a new product has not plain sailing from the first start. But he thinks that the first product will be sufficiently good to use with the cast-iron scrap and other improvements which may be expected afterwards. Success would change the very face of the hinterland pros-

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peets, as so much iron is required for the Witwatersrand gold mines, to say nothing of the Natal coal fields, and the general run of manufacturing. The Pretoria people must thoroughly believe in the undertaking, as a private line is being constructed which will link up the iron works with the South African Railways.

#### LABOUR AFTER THE WAR.

There is a universal idea that labour in the old countries will be scarce after war. This will evidently only refer to a few trades, as a significant Reuter's cable appeared this week stating that the British Miners' Federation has passed a resolution in favour of a six-hour working day. The contention was that it would be impossible to re-absorb railwaymen, dockers and miners after the war on the eight-hour basis. This is mentioned in support of a statement recently made by the Premier, that large numbers of people will flock to this country after the war. Another pointer in this direction is the great army of womenfolk now working in all parts of Britain, and they will not willingly relinquish their incomes, more particularly since the British women have votes. Certainly many things substantially point towards an influx of white people after peace, which must be a blessing in view of the last census returns.

#### PARAFFIN OIL.

The sensation of the week is the almost sudden stoppage of paraffin, although the acute scarcity was mentioned in these notes last week. It has become a most serious matter as one manufacturing firm in Johannesburg has shut down a department where paraffin was one of the principal ingredients used in the article made. Before accepting this statement special enquiries were made and so far not a tin of paraffin could be had, although one shop referred you to another. The information was that 13s. 6d. had been paid at a shop near the station

and 15s. 6d. for a tin on Hospital Hill. It is said that the Potchefstroom Town Council has approached, with others, the Government officials in reference to the all-important matter of obtaining supplies. The fact is that many farmers and gardeners are at their wits' end to obtain power for pumping purposes, but now they cannot obtain paraffin for the numerous small motors used. There are also many of the smaller towns in a similar fix for lighting purposes. It is also a serious matter for some manufacturing places who fitted up oil motors which cannot be worked after their stocks actually on hand become exhausted. A salt works in the O.F.S. is said to be perilously near the end of its paraffin stock, upon which they depend largely for their power supply by the oil motors. The idea of approaching the Government for urgent steps to be taken is that the shipping controllers might arrange for a special ship to come to South Africa with paraffin. From an authoritative source it has been gathered that there is no paraffin on the water. This hardly seems feasible, although the fact of the Government being approached supports that statement, because responsible firms would not make representations to Pretoria unless the urgency was great.

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## OILS, WHITE LEAD, BRUSHWARE AND GLASS.

The best salad (cotton) oil is exceedingly scarce, and the last price is said to be £6 a case of two-fours. There is a little olive oil obtainable at 25s. to 30s. per gallon. Turpentine cannot be had in wholesale quantities, but a few cases of ten-ones are available at 110s. per case. Linseed oil is being bought up, but fair stocks are, so far, always forthcoming at a price. The boiled oil is 1s. 6d. per gallon higher than the raw in value from merchant to merchant. At last fair consignments of plate glass have been received, but as most had been sold to arrive there will not be a great surplus for the general trade. British plate glass,  $\frac{1}{4}$  in., has advanced from 6s. 6d. to 8s. per foot, and mirror (S.A.) 7s. 9d. to 8s. 6d. Window plate glass is now beginning to be the trouble as the demand is always constant, but new supplies are erratic. Brushware is expected within a month; quite a full range of kinds and sizes, but at considerably higher prices. Glue is very scarce indeed at 3s. 6d. per lb., but glue powder is fairly plentiful at 2s. 7 $\frac{1}{2}$ d. to 2s. 9d. per lb.

## TIMBER AND ROOFING IRON.

Deals in Johannesburg rose on Thursday up to 2s. 1d. per ft. as stocks are getting less, although so far there is no actual shortage. It is said that some Baltic timber may be expected before any real scarcity occurs. The reasons given for the advance is that the Swedish exchange has gone further against London to 13·40 kroners, whereas it was 14·80 about a fortnight ago. In consequence of the high price of imported timber, local firms are offering South African timber. According to one trade circular, the following building materials are offered, viz., mouldings, architraves, picture rails, cornices, ceiling fillets, skirting, nosing, etc. The firm is also about to commence running yellow wood flooring.

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BRICKS, CEMENT, LIME, ETC.—Pretoria Portland Cement, 9s. 3d. bag; 8s. 3d. truck loads; lime, white, unslaked, 7s. 6d.; truck loads, 6s. 6d.; slaked, do., 5s. 6d.; blue, 4s. 6d.; plaster lime, 5s. 6d.; bricks, stock, delivered, 65s. to 70s.; wire cuts, 70s. to 80s.; pressed, 70s. to 80s. 1,000; road transport expensive when obtainable; salt glazed, £17 17s., and white glazed bricks, £35 per 1,000; roofing tiles, £17 10s. to £27 10s. per 1,000; glazed tiles, 17s. 6d. to 27s. 6d. yard; paving cement tiles, 8s. 6d. per yard laid; reinforced concrete columns, 6ft. plain, 25s.; fluted, 30s.; fireclay bricks, £8 10s. to £10 10s. at kiln, per 1,000; clay chimney pots, 45s. to 80s., according to height (12in. to 18in.) per dozen.

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2½in. and up long, 60s. per 100lb.; ½in. diameter, 2½in. and up long, 55s. 100 lb.; ½in. and 1in. diameter, same price as ½in. diameter; nuts, ½in., 1s. 3d. per lb.; ½in., 85s.; ½in. 95s.; 1½in. and 1½in., 85s.; 1½in. to 1½in., 87s. 6d.; 2in. up, 92s. 6d.; washers, all 45s.; rivets, 3-16in., 1s. 6d. lb.; ½in., 5-16in., 1s. 6d. lb.; 7-16in., ½in., 1s. 3d. lb.; ½in., 75s. to 80s.; ½in., 72s. 6d.; ½in. up, 60s. 100 lb.; shoes and die, 32s. 6d. to 35s., 100 lb.; rails, £25 per ton; picks, 4lb., 40s. dozen; shovels, 80s. to 90s. dozen; drill hammers, 5½d. to 6d. per lb.; hammer handles (best American), 14in., 4s. 6d.; 24in., 10s.; 30in., 14s.; 36in., 17s. 6d. per dozen; metal, anti-friction knoxite, 11d. to 4s. and special prices per lb.

In consequence of the daily, and even hourly, variation in prices, the Editor will answer reply-paid telegrams to verify any quotation in our list.

The report of the directors of the Rhodesia Copper and General Exploration and Finance Co., Ltd., for the period ended March 31, 1918, states the issued capital is £264,016, in 1,173 405 shares of 4s. 6d. each, and there are options outstanding on 16,828 shares at par until the termination of the war. The properties remain the same as at the date of the last report. The income from investments and interest during the period under review amounted to £6,331, and profit from shares sold to £2,935, making a total of £9,266. The expenditure in London and South Africa amounted to £2,560, leaving a credit balance of £6,706, which, added to the amount brought forward, makes a total of £8,402 to the credit of profit and loss account. The directors regret that owing to the depreciation which has taken place in the value of some of the company's interests, they do not feel justified in recommending a distribution by way of dividend. The New Copley Collieries, Ltd., has paid two dividends of 5 per cent. each, but owing to enlistment of workmen in His Majesty's Forces, to heavy increase in wages, and in the cost of mining supplies generally, coupled with an output now reduced to less than one-half of the estimate mentioned above, the cost of coal-getting has been increased beyond the selling price, resulting in heavy losses. Serious water troubles have had to be dealt with necessitating the purchase of additional pumps, and part of the workings have been closed by arrangement with the Coal Controller. In addition to these two investments, in respect of which it is suggested that a sum of about £32,000 be written off, it is also considered necessary to provide about £7,000 for depreciation on Government securities, about £8,500 on quoted shares, and £12,000 on other securities. Altogether the statement of the financial position of the company at March 31, 1918, shows a deficiency of £88,113, which has arisen by depreciation in the value of British Government, Canadian, Egyptian, and Chinese stocks, sundry debentures and shares £59,344, and expenditure in connection with mining claims, land, and concessions in Northern Rhodesia £28,769. The directors propose that this amount be written off, and that an application be made to the High Court to sanction the reduction of the issued capital and for an adjustment of the unissued capital to £241,555, divided into 1,585 126 shares of 2s each and 16,828 shares of 4s. 6d. each. A resolution to give effect to these proposals, as set out on the accompanying notice of meeting, will be submitted to shareholders, and if such resolution be passed by the requisite majority, it will be submitted for confirmation as a special resolution at an extraordinary general meeting, after which the court will be asked to approve the proposals. In the event of the court confirming the reduction of capital, the company's income and profits should be available for distribution by way of dividends, and the company's position will be considerably strengthened.

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## Engineering Notes and News.

### SAFETY IN WINDING OPERATIONS.

[By J. A. VAUGHAN, M.I.C.E.]\*

THE author has chosen a title which covers a very large field but intends to confine his remarks in the main to the question of the safe handling of the winding engine, having recently dealt with the subject of the winding rope in the proceedings of another Institution. On the Witwatersrand, besides a large number (about 1,000) of small auxiliary hoists or winches of average horse power—16 steam and 65 electric, there are installed main winding plants to the extent of 443 in number, of collective horse power totalling 173,088. These statistics refer to 31st December, 1916, and are the latest obtainable. The comparative figures subsequently quoted will therefore be taken for that date, although later figures are in these cases available. Of this total of 443 main winding plants, 262 are driven by steam and 181 by electric motor. The number out of use is not known, but the published return shows that 372 were licensed for the conveyance of persons, the maximum capacity of the conveyances being rated for 10,790 persons. Taking 200,000 persons as the number employed underground on the Witwatersrand it would only need 20 trips to lower and raise this complement in the 242 shafts. But the lowering and raising operations are not always simultaneous, the loading of the cages is not always up to full complement, and the trips at the beginning and end of the shifts are not nearly all the occasions on which persons are being transported. Instead of trying to estimate the number of hoists in which there is a human freight, it is better to regard the general winding operation in trying to estimate the accident risk. It also has to be remembered that accidents such as overwinding cause annually great and expensive damage to plant, besides the personal casualties that will be treated later on. Let us suppose, what are very close to the facts, that 400 main winding plants are regularly at work and that an average of 9 trips per hour are made; a "trip" being the downward and upward journey of the conveyance whether the companion drum is simultaneously in motion or not. The annual total will be just over 31,000,000, while the winding accidents such as we are considering amount to about 62, equivalent to a rate of 1 in 500,000. This low accident rate could be regarded with complacency if it were felt certain that the mistake was in all cases inevitable and the resulting accident absolutely unpreventable. Regarded in another way, it may be assumed that 800 certificated engine drivers are responsible for 50 accidents annually, so that if each driver was restricted to one accident he would have a chance of driving for 16 years. However, it is usual for a first offence to be dealt with by an official caution, subsequent offences by short periods of suspension, while it is extremely rare for a driver's certificate to be cancelled. It has never been proved that suspensions of certificates or prosecutions in the criminal courts have ever actually brought about a reduction

in the number of winding accidents, but those who await the proof before believing and who are unprepared to allow that any deterrent effect is produced in the delinquent will still doubtless admit the possibility or even probability of "encouraging the others." It is fairly certain, however, that, if the supply of capable drivers is not maintained, the accident rate will increase. The training of winding engine drivers has been discussed off and on for the last fifteen years, but no satisfactory scheme has been evolved. Since the year 1904, there has been a provision in Regulation 308 (5) for a sort of adult apprenticeship. This regulation allows for a person being accepted as a candidate for the *viva-voce* examination who having had one year's charge of engines or boilers, including at least six months' charge of a reversing engine, has also served six months' apprenticeship under a certificated driver in a main hauling engine room. This plan has not been successful, no more than one candidate per annum having been so trained. The greater number of locally trained winding engine drivers qualify under Regulation 308 (4) for examination, on small rock hoists and winches. This regulation states the condition, viz., "that he has had at least one year's charge of an engine or engines used in the ordinary hoisting of minerals, unless he is the holder of an engine driver's certificate, in which case a period of six months shall suffice." It has to be remembered that twenty-one is the minimum age of applicants for winding engine driver's certificates. To enable the youth of the country to qualify in the best way it remains to be decided what is the most suitable training between the ages of 16 and 21. The author feels disposed to commend a system proposed to him in 1916 by two eminent engineers who were then considering apprenticeship schemes for the various trades. The proposal was that the engine driver apprentice should after 2 years in the Trade School serve 1½ years learning fitting and turning, 1½ years tending boilers and engines, and the remaining time (at least 12 months) under a certificated driver in a main winding engine room. The number of candidates presenting themselves for examination has been diminishing, the average number certificates issued annually during the last five years being less than fifty per cent. of the average number issued during the preceding similar period. The most recent figures available as to the number of certificated winding engine drivers in service on the mines of the Witwatersrand relate to the 1st August, 1916, at which date there were 797 driving engines licensed for the conveyance of persons, 15 driving unlicensed hoists, whilst 23 were otherwise employed. If five per cent. is a reasonable wastage to estimate, then at least 40 new drivers should be produced each year. The average number of certificates issued by the Johannesburg Board of Examiners for the past five years has been only 24, so that it appears quite time that a satisfactory and popular system of apprenticeship was put into operation if the mining industry is to continue on the same scale as at present. It would be very rash, however, to suppose that an assured satisfac-

\* Paper read before the S.A.A.A.S.

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tory supply of perfectly trained winding engine drivers, even working shorter shifts and medically inspected periodically as has been sometimes suggested, would entirely provide against "overwinding" and "runaway" shaft accidents. By closely considering the nature of the winding engine driver's duties it may be seen that some small proportion of errors should be regarded as inevitable. The right thing must always be done at exactly the right time and a moment's lapse at the critical instant is very likely to lead to disaster. In endeavouring to prevent mishap following on the error of omission, it is therefore wise to employ all automatic safeguards that engineering ingenuity can devise, provided that no new elements of danger are introduced that are not of less possible consequence. Before considering the safety appliances at present in use, their more general application and the possibilities of the introduction of further preventive measures, attention may be directed to the classes of accident that now occur and their frequency and importance compared with other shaft accidents. The accompanying table shows this comparison for a period of ten years. From a study of the figures in the various columns it will be seen that, except in the cases of the first and second columns, the percentage figures for Class I., "Overwinds and Runaways," and Class II., "Ropes, Chains or Connections Breaking," are fairly low. The non-casualty accidents reportable under Regulation 274 outside the two classes just mentioned may obviously be expected to be of much rarer occurrence and the higher percentage figures in Column 2 in these classes should not occasion any surprise. It may be of interest to point out here that the classes of accident

that produce the great bulk of the casualties in shaft accidents are "Material (stones, timber, tools, etc.) falling in shaft"; "while ascending or descending by machinery—exclusive of accidents under Classes I. and II.;" "struck by cage or skip"; and "miscellaneous." The meaning of the term "overwinding" is that the conveyance is either raised or lowered too far, but, in the case of a non-casualty accident it is not supposed that a failure to exactly meet the landing is reportable. In the case of a "runaway" it is meant that the winding drum has become uncontrolled, being neither in hand by the clutch or the brake. Overwinds or runaways due to defective plant amount to about 14 per cent. of the total, that is to say, 9 out of the average of 62 may be so classified. The two chief causes of this class of accident are: (1) Troubles with the reversing or control lever: correct design and regular examination should provide against these. (2) Failure of the depth indicator to record properly. Chain and sprocket drives have been mostly at fault; they should be watched and the chain not allowed to become too slack. In the one or two instances where rod and pinion drives have failed the keys of the wheels have been allowed to become slack and drop out. Here again watchful care should be exercised. It is really doubtful in some cases just mentioned and others in which the locking devices of clutches or brakes have failed, whether the accident should not really have been attributed to the driver's deficiency in the matter of close inspection of the plant in his charge.

(To be continued.)

An extraordinary meeting of the Tweefontein Colliery, Ltd., has been convened for the purpose of **Tweefontein to be a** authorising the directors to enter into **Holding Company**, agreement with the Tweefontein United Collieries (Transvaal) under which the latter will acquire the undertaking and assets. Tweefontein United Collieries, the official circular explains, was recently formed in the Transvaal and has acquired the coal assets of the Rand Selection Corporation, which includes an allotment in the Transvaal Coal Owners' Association. The purchase price payable to Tweefontein Colliery under the agreement is 75,000 cumulative preference and participating shares of £1 each and 150,000 ordinary shares of £1 each in the Transvaal Company. The preference and participating shares are entitled to priority in capital, and out of the profits available for dividend to a cumulative preference dividend of 6 per cent. and to a further 4 per cent. after the ordinary shares shall have received 6 per cent. The Transvaal Company will also pay this company for the stores in hand the value at which they stand in the company's books. The Transvaal Company will acquire from the Henderson Consolidated Corporation the remainder of the Farm Tweefontein No. 236, with the colliery thereon, which has been recently opened up and equipped by the corporation; also the adjoining Farm Waterpan, No. 390, the two properties together comprising about 10,000 acres. The purchase price payable for these two properties will be 120,000 ordinary shares. The Transvaal Company have agreed to give to each holder of preference shares an option to call for an allotment at par of one similar share in the Transvaal Company for each preference share held in this company. The Henderson Consolidated have also agreed to give the option to purchase at par one ordinary share of the Transvaal Company for every ordinary share held. These options extend for six months after the date of withdrawal by the Treasury authorities in England of their prohibition to the issue of capital or two years from the date of the approval by the shareholders of this company of the sale and purchase agreement, whichever shall be the later date, and option certificates will in due course be issued to the shareholders. If the resolution is passed this company will become a holding company, and its assets will comprise shares in the Tweefontein United Collieries.

## PERSONAL.

The Transvaal Mining Leases Board has now been constituted as follows: Sir Robert Kotzé, Government Mining Engineer, chairman; Sir William Hoy, General Manager, S.A.R.; Mr. F. E. Kanthack, Director of Irrigation; Mr. H. E. Farrer, Secretary for Finance; with Mr. J. R. Mackinlay as secretary.

\* \* \* \*

Mr. F. S. Malan, Minister for Mines and Industries, left this week to attend a meeting of the South African Academy at Bloemfontein; he returns on Sunday, the 21st inst., and will then leave on an extended tour through the Northern and South-Eastern districts of the Transvaal, accompanied by Sir Robert Kotzé, State Mining Engineer, and Mr. Tudor Trevor, Inspector of Mines. The itinerary will include a visit to the recent discoveries on the Olifants River. Mr. Malan will address a meeting at Lydenburg on the 29th inst., another at Vryheid on the 31st, returning to the capital on the 1st of August.

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In presenting their 22nd annual report to the shareholders for the year ended December 31, 1917, **Globe and Phoenix.** the directors of the **Globe and Phoenix** state: The results obtained from the development work done to September 30

last have already been published, but the results of the work done during the last quarter of the year, which should have accompanied the report, have not been received in time for printing, but will be read at the meeting. Notwithstanding that a portion of the development was of a prospecting character, the board consider the result satisfactory, as although £407,292 were extracted from the mine during the year, the ore reserve figures show an appreciation of some £40,000 over those of the preceding year. The development of the copper location has proceeded under the supervision of Mr. D. P. McDonald. So far the results obtained are sufficient to justify further work. The estimate of the ore reserves at December 31 is as follows: 184,053 tons containing 266,455 ozs., value per ton 28·945 dwts., of a total value of £1,119,111. These compare favourably with the position existing as at December 31, 1916. The vertical shaft is now in commission, and labour during the year has been satisfactory. The net profit for the year 1917, after bringing in £4,767 and including £54,500 brought from the reserve fund, as intimated in the last report, amounted to £288,012. A distribution of 1s. 6d. per share was paid on May 15 last out of the amount brought from reserve, and three interim dividends have been paid in respect of the year 1917, viz.: 2s. per share net, paid in July, 1917, £80,000; 1s. 4d. in October, 1917, £53,333; 1s. 4d. per share, less tax, paid in January, 1918, £53,333. Out of the balance of £64,009 the directors recommend a final distribution of 1s. 4d. per share, less tax, absorbing £53,333, leaving £10,676, which the directors propose to carry for-

ward. The total dividends distributed for the year 1917, including that now recommended, amount to 6s. 8d. per share, without taking into account the distribution of 1s. 6d. per share made on 15th May, 1917. The increase shown in the revenue account for 1917 is due to the facts that during the year an amount of £70,158 was received, being the costs recovered from the Amalgamated Properties of Rhodesia, and further, that an amount of only £8,783 was spent in connection with the action as compared with £53,471 last year. The output for the year was £403,370 19s. 11d., bringing the total production of the mine to December 31, 1917, to £5,324,513. The appeal by the Amalgamated Properties of Rhodesia (1913), Ltd., against the decision of Mr. Justice Eve duly came before the Court of Appeal in June last. The case was heard by Swinfen-Eady, Bankes, and Warrington, L.J.J., and a weighty judgment was delivered in favour of this company. In December last an appeal to the House of Lords was lodged, and it is hoped that it will be heard at an early date. The year's working has been again severely handicapped by the continuance of the war, but the board are pleased to report notwithstanding this, the very satisfactory profits shown above.

\* \* \* \*

The Lourenco Marques Government Gazette announces that the **East Coast Enterprise.** Anglo-Portuguese (East Africa) Concession, Ltd., English company, with a capital of £50,000, has been granted commercial, industrial and mineral exploration rights in Portuguese East Africa. This company has bought certain existing mineral rights in the area between the Transvaal railway and the southern border, and contemplates a thorough prospecting campaign herein. The general manager, Mr. Mansfield, who is now on the spot, is a Klondyke pioneer, and the directors are Messrs. E. T. Boxall, Berrington, O. London and Robert Hughes. The last-named was the first Lord Mayor of Cardiff.

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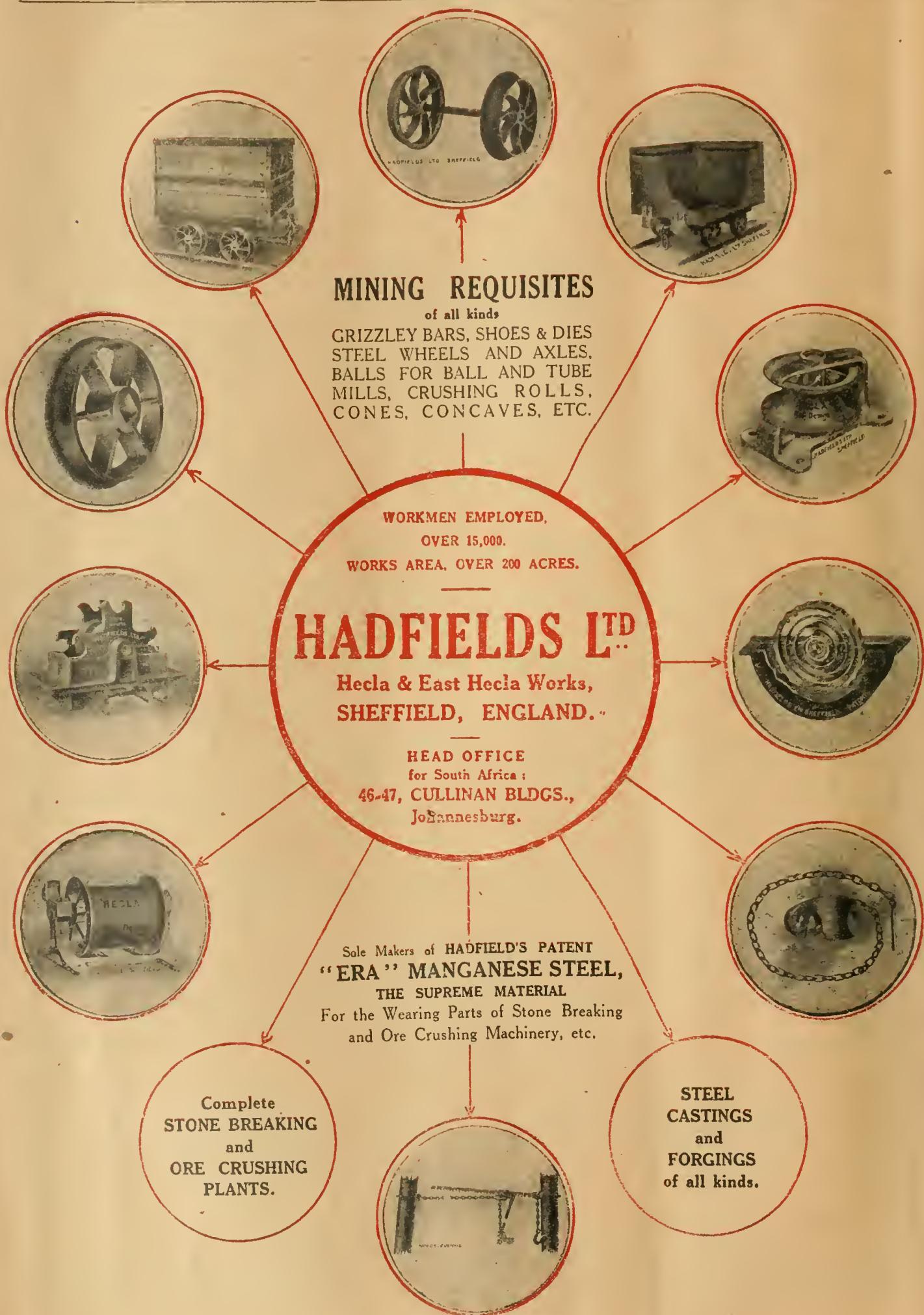
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## Correspondence and Discussion.

### Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

#### The Price of Gold and the Low-Grade Mines.

To the Editor, *S.A. Mining Journal and Engineering Record*.

Sir,—The correspondent whose views are published in the Notes and News column in your issue of July 18th bases his argument entirely on the assumption that in England paper money has depreciated in value as compared with gold. I know of no tangible evidence in support of that view, and unless your correspondent can prove that his assumption is correct the whole of the interesting structure which he builds on it falls to the ground. If he digs deeper into the question he will find that an ounce of gold will buy less and not more of the particular commodities we want in Holland and Spain than it will buy in England. The exchange rates in neutral countries are against England because neutral countries want commodities and not gold for their exports to England. The Spaniards and the Dutch are more in need of coal than of gold. The gold holding of the Bank of Spain has risen from £21,804,000 before the outbreak of war to £81,685,000 on May 4th this year, which is the last return I have seen. In Holland the increase has been from £13,500,000 to £60,153,000.—Yours, etc.,

SAMUEL EVANS.

#### A Belgian Appeal.

To the Editor, *S.A. Mining Journal and Engineering Record*.

Sir,—May we appeal to your feelings of righteousness and of benevolence in asking you to open in your worthy paper a subscription on behalf of our Belgian Order of St. John of Jerusalem? Without having any interference from or connection with the English Order, which is covering the British Empire only, our Belgian branch has been constituted in view of helping the victims of this war, especially the blinded soldiers and the distressed widows of our brave men. We perfectly realize that you have yourselves to support your own charities, but we cannot help to lay stress upon the fate of our fighting men, because their fellow-countrymen, unable to help them for the time being, will be so exhausted after the war, we are afraid, that the task will be beyond their power. The soldiers of every country in this war have at least this comfort of remaining in close touch with their families, through leaves or letters. The Belgian soldiers, isolated from their country by the German trenches, are without any news from their relatives for almost four years. Yet, they are the gallant soldiers of that little army which at Liège barred the road to the German hordes during a fortnight, losing the fourth of their effectives, but allowing France to hastily complete her mobilisation. They are those soldiers who by their successive raids from the "camp retranché" of Antwerp have held up two German army corps, marching towards the Marne where has been won the first great battle for Freedom and Righteousness; enemy reinforcements might have turned the scale. They are those soldiers who, tired, even exhausted, through that awful retreat from Antwerp, have been asked to hold three days on the river Yser, waiting for French help, and who held unbroken for twelve days. They are those who first experienced the disastrous and at the time unexpected use of poisonous gas. Many of them were blinded for ever or dangerously struck, and their cure will take perhaps several years. And they are those who fought with such a gallantry against a foe tenfold superior in numbers, during the now proceeding great battle that they succeeded in taking many prisoners, thus deserv-

ing the warm congratulations of the British Press. Perhaps that, through the great distance which separates your country from the battlefields, the sufferings of our soldiers are not quite realised by the people at home. But still those sufferings are borne for a cause dear to you, a cause which is yours as well as ours. What would have happened to the civilization of the world if Germany while in her original strength, had succeeded in crushing the British and French armies at the very beginning of the war and had then been able to turn all her power against any liberty-loving country? To-day Prussian Militarism, though still powerful, bears in itself its germ of death. It will be of immortal glory for our little army to have struck the first blow, of course for the sake of our own country first, but also for the whole world's sake. It is therefore a debt of gratitude that the world has contracted towards our heroic soldiers, and we feel sure, Mr. Editor, that in the appeal we hope you will be so kind as to issue, you will put this point in light in the most suitable way for your readers. With our warmest and anticipated thanks.—Yours, etc.,

DR. SMETS MONDER,

Vice-Chairman and Hon. Sec.

Belgian Order of St. John of Jerusalem,  
Kew Gardens, near London,  
14th May, 1918.

[Subscriptions should be sent direct to the above at Kew Gardens, or to the Belgian Consul-General in South Africa.—Ed.]

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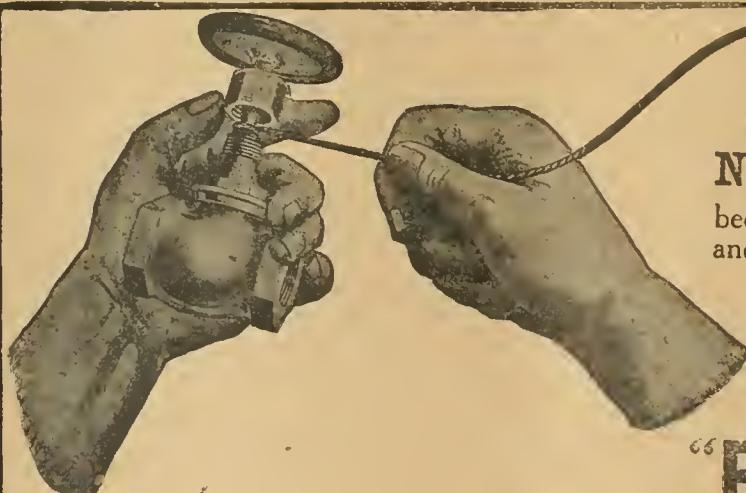
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## The Week's Meetings.

### NATIONAL BANK.

PRETORIA, Wednesday.—The adjourned ordinary meeting of shareholders of the National Bank of South Africa, Ltd., was held this afternoon, in the board room of the National Bank, Pretoria. The Hon. Hugh Crawford presided. In moving the adoption of the report and financial statement, the Chairman said, that like its predecessor, the financial year under review brought many difficulties, but these had been faced to the best of their ability, and, as would be observed, they had gone on from strength to strength. The natural expansion of their business, it was true, had had to be curtailed because on account of war conditions, a serious staff shortage had been experienced. They had, however, recently acquired the banking business of the African Lakes Corporation, Ltd., and as a result branches of the bank had been established at Blantyre and Zomba (Nyasaland), at Fort Jameson (N.E. Rhodesia), and at Chindi in the Mozambique Province.

The paid-up capital stands at £2,850,000. The reserve fund appears at £700,000, showing an increase of £175,000. Notes in circulation stand at £2,585,900, showing an increase of £797,000. The deposits, a very important item in the balance sheet of a bank, it would be noted with satisfaction amounted to £32,138,000 as compared with £27,246,000 last year. To deal with the assets side they would find that their cash assets, including money at call in London, totalled £8,555,000. Investments stood at £4,756,000—all written down to the market value at 31st March, 1918. They had not departed from their practice of retaining under that heading only "gilt edged" stocks consisting almost entirely of British and Colonial Government securities. The item showed an increase of £1,464,000 mainly due to their having invested a large sum in short dated British treasury bills. Bills of exchange showed at £8,004,000 as contrasted with £5,357,000 the preceding year. At first sight that increase seemed highly gratifying, but the figures were somewhat inflated by reason of the abnormal time taken in conveying bills to their destination for acceptance. The liquid assets consisting of cash, money at call in London, Investments and Bills of Exchange, represented 59 per cent. of the bank's liabilities to the public and amounted to £21,300,000. Bills discounted, loans, etc., aggregated £18,129,000, as compared with £17,158,000 last year.

#### Profit of £352,600.

It would be observed from the profit and loss account that a net profit of £352,600 had been earned as contrasted with £374,340 the year before. That result was arrived at after applying £50,000 in reduction of bank premises. The Board recommended payment of a dividend of 6 per cent. per annum. For the first six months of their financial year an interim dividend at the same rate had been distributed, and with the further distribution proposed the amount paid

in dividends for the year would be £171,000. An allocation of £150,000 to the reserve fund was recommended, bring it up to £850,000, which meant that the paid-up capital and reserve would aggregate the substantial amount of £3,700,000. Depositors would not fail to recognise the ample protection that afforded them. There was then left £35,736 to carry forward. Shareholders had the assurance of the Board that bad debts were provided for.

The note circulation during the year under review had certainly increased, and he frankly admitted there had been a good response to the plea for economy in the use of gold. At the same time there was still a large portion of the European community employing gold for its daily requirements. In most cases he was sure it was only thoughtlessness which retarded public assistance in the conservation of gold so urgently required for purposes of exchange. We venture to hope that would be borne in mind by those who were not in the habit of employing notes, and that in the future they would avoid as much as possible the use of gold.

#### Trade Situation.

They in South Africa had much to be thankful for, more, he felt, then they realised. Up to the present they suffered none of the privations and hardships which their fellow members of the Empire and its Allies in Europe had to endure. The deposits with the South African banks amounted at December, 1917, to nearly £65,000,000 as compared with £55,000,000 at the end of 1916. That was probably the best reflex of the prosperity of the country which could be had, particularly when there were taken into account the loan floated by the Union Government and the sums which had been invested in British war loans. While many of their industries were in process of development, the gold mining industry continued to be their backbone. It was, of course, to be regretted, particularly in these times, that there should have been any diminution in production. The new areas now being developed would before long join the producers. They had been inclined in the past to talk a little glibly of the gold mines as a wasting asset, which definition, although perhaps literally true, could easily be overemphasised. They should keep in mind that there were very large expanses still to be opened up, and that the mines now producing and those nearing the producing stage were likely to keep the output at a high level until it was reinforced from areas as yet untouched. He was so convinced of that that he believed their grandchildren would enjoy the benefits from the industry in a not much lesser degree than they did to day.

At the outbreak of war it was assumed that diamond mining would be adversely affected, but the course of events aptly illustrated how unsafe it was to prophesy. The industry had probably never been on a sounder basis than it was to-day, diamonds having been produced to a value of £7,713,810 as against £5,725,394 in 1916. Tin production remained a more or

less stationary quantity, the value of the output in 1917 having been £375,615 as against £356,447 the year before. A pleasing example of enterprise promoted by war conditions was to be found in the action of the Zaaiplaats Tin Mining Company, Limited, in smelting and selling its product in this country. The output of copper in value was practically the same as in 1916, the respective figures being £106,085 and £1,132,140. At the moment he regretted to say it appeared as if production of the metal was likely to show a serious diminution this year. Coal statistics showed an improvement over 1916, the respective values being £3,255,659 and £2,715,313. By-products of coal were receiving enhanced attention, and they looked forward to the time when the industry would become one of great importance.

#### Wool and Maize.

Last year reference was made to the abnormal price of wool, which price, although still high, was now slightly lower. Scarcity of freight continued to impose serious inconvenience and to lead to congestion of wool at the ports

Referring to the maize industry, the speaker said the surplus would probably be 2,000,000 bags, of which 1,500,000 would be available for export. The wattle bark industry was, he was pleased to say, still prosecuted with keen enterprise. Ocean freight, however, was again the obstacle, particularly as concerned those producers who neither own presses nor are in a position to have their bark pressed. Plant for the extraction of tannin is in operation in Natal and was likely to be increased, so that freight disabilities might after all prove to be a blessing in disguise. He understood that after extraction of the tannin, the residue was now used with fair results in the manufacture of the coarser grades of paper, a striking illustration of the uses to which products, long discarded as virtually worthless, could be turned with scientific treatment.

After referring to the importance of afforestation, Mr. Crawford spoke of the future of fruit farming. The industry, until the resumption of adequate shipping facilities, must be severely handicapped, but that there was a great future ahead must be patent to all. In the meantime, more might be done by way of developing the canning and drying trade. It was interesting to note the greater development of pineapple growing on a large scale to be coupled in one case with the erection of a canning factory on the estate.

The prospects of sugar planting were excellent, and the industry was surely never on a more favourable basis than it was to-day. The 1916-17 crop was 114,500 short tons, and it had been estimated that the 1917-18 season will yield 106,000 tons. They expected excellent developments from the enterprises connected with the by-products of sugar. These were as yet merely in their initial stages, but they might, he thought, look forward with confidence to the time when they would fill an important part in their economic life. In the meantime they had hopeful indications in the accomplished manufacture of such commodities as Natalite and Glucose.

### Meat Export Trade.

The meat export trade had, so far, fulfilled their expectations, but they hoped that their farmers would strive to improve their herds. When they considered the immense tracts of suitable ranching land available, there was every encouragement to believe that the industry would in time become one of first rate importance. Even when war conditions—which prompted and helped them to enter that trade—were over, it should not be difficult to take full advantage of their initial success, the position being, as he pointed out last year, that animal life had for a considerable time barely kept pace with the increasing requirements of the world. While on the subject of stock farming, he should like to refer to the cultivation of new grasses which must have an important bearing on their future as a stock raising country. He would in particular direct attention to the well known "Kikuyu" Grass (*Pennisetum Longistylum*), the feeding value of which was the highest known in the sub-continent. This grass answered splendidly to their climatic conditions, and its free introduction should tremendously increase the stock carrying capacity of our farms. Before passing from farming topics, they should pay tribute to the Land Bank for the assistance it rendered to the agricultural industry. The existence of the various Co-operative Societies had also, on the whole, been beneficial, and the tendency of the movement would no doubt be to spread. The principle of co-ordination was not only good, but its adoption was almost imperative for the proper development of their huge agricultural assets. Speaking generally, he thought those societies would do better if they were to leave retail trading alone and concentrate on realising the products of their members to the best advantage.

### New Industries.

The chairman then referred to the establishment of new industries, and said it would appear that they had now more thoroughly set out to develop their industrial resources than ever before, and that increased attention was being paid to the exploitation of the illimitable wealth lying dormant. Millions of acres of good land, however, remained untilled, representing millions of pounds of idle, unproductive capital, and yet they heard to-day that inconvenience might be caused to consumers because of difficulties in the way of importing such a staple commodity as wheat. It was an economic axiom that the real basis of a country's credit was in excess of production over consumption, and if they judged the Union of South Africa by that standard they found cause for hope and satisfaction. After referring to the statistics of imports and exports and the sound financial position of the Union, the chairman said gratitude was due to their Government for the assistance it rendered to industries and trade.

Too often, perhaps, they took this help for granted, failing, for example, to realise the good work done by the Department of Agriculture and the stimulus it gave to the farming industry. They thought, he was afraid, even less of what they owed to the Railway Administration which in times of great difficulty was carrying on in a most praiseworthy manner. They hoped that their already great system, with its mileage of 9,522 miles, would, after the war, be further extended in order to tap districts still unserved but which promised a rich harvest.

### Commerce and Shipping.

In his remarks last year the prosperity of South Africa was mentioned, and the exceptional prices obtained for their products were alluded to. That state of affairs had been more than maintained so that, speaking generally, producers continued to enjoy wonderful prosperity. The main difficulty, and it had been a very real one, was the scarcity of freight, and it was useless to conceal from themselves that still further restrictions of shipping might be necessary, and that in consequence it might be even more difficult than it was now to obtain freight for their products and for those articles which they still require to import. South Africa was fortunate in that it could produce commodities vitally necessary to the Empire and its Allies, and it seemed likely that many of these necessities would remain in their present demand for some time after peace was restored. For the present their producers and merchants were enjoying an era of unique prosperity, a good deal of which, it should be admitted, was due to the abnormal conditions of the times. Without shedding one iota of confidence in their ultimate future, he would enjoin upon those people the desirability of conserving their extraordinary profits and of husbanding their resources in order that they might have a reserve to tide over leaner years which might intervene between the resumption of more normal conditions and the fuller development of the country. In a developing country such as theirs was, they were sorry that for some time to come they could not, on account of the war, hope to get capital as in the past from Oversea. It was therefore pleasing to observe the response to the Union Government 5 per cent. loan of 1916 and 1917, which was subscribed to the extent of over £10,000,000.

### Need of Education.

Efficient education would be of greater value than ever in the days that lay before them, and his hope was that those responsible for the training of the rising generation would realise that more and more fully. Much time was devoted to instruction in dead languages and other impractical subjects which could be better utilised in the study of live

languages and subjects of scientific and vital import. If, for example, the time now given to study of languages no longer spoken were devoted to the pursuit of science, their youth would be equipped with a substratum of knowledge which would enable it to pass in its mature years to deeper scientific research and the production of mechanical appliances. As a sequel the process of perfecting so many of their by-products which in the past had been more or less the secret of other nations, would eventually be attended to in this country. On several occasions he had made reference to their monetary system and the apparent desirability of boldly embarking upon the adoption of the decimal coinage and the metric system for weights and measures. He gathered that the Imperial Government was in sympathy with such a change and he was hopeful that when the war was over the question would be taken up definitely. The bank would be happy to provide any of its clients, who cared to apply, with full information regarding the decimal coinage system, and he hoped that before long the Union Government would move for its adoption. They strove to be a National Bank in the best sense of the word, remaining aloof from politics. He often wished that party politics could be relegated to a secondary position and that the energies of the community might, as a result, be more fully devoted to the development of their economic resources. He was convinced that progress would be much accelerated and that not only without loss but with gain in mutual respect and esteem among all sections of the community.

He referred last year to the difficulties experienced by reason of the absence of so many of the bank's officials on active service. They had now even more officers with the colours. In many instances it had been very difficult to grant the necessary leave, but in the combatant members of their staff they had great pride. It was his sad duty to mention that since they met in June last year a further 23 members of their staff had been killed in action or had died from illness or wounds, 14 had been wounded in action, six were prisoners of war, and three were missing. He moved the adoption of the report, balance sheet, profit and loss statement, and the recommendations of the Board.

Mr. Emrys Evans seconded, and the motion was unanimously adopted.

The retiring directors, Mr. Patrick Duncan, Mr. H. O'K. Webber and Mr. J. Emrys Evans were re-elected. The auditors, Mr. Robert Baikie and Mr. John Dougall were re-appointed. A vote of thanks to the general manager and staff and to the directors terminated the proceedings.

Amongst those present at the meeting were Sir Edgar H. Walton, K.C.G., M.L.A., Messrs. James B. Taylor, H. O'K. Webber, the Hon. A. Oliff, Messrs. S. J. Renaud, Patrick Duncan, M.L.A., E. C. Reynolds, W. Dunlop, A. C. Duff, D. H. Swart, Johann Rissik, Chas. Maggs, H. L. Malherbe, E. Davidson, G. W. Herdman, Andrew Johnston, G. H. Johnston, Robert Hamilton, C. Haines, F. W. C. Bell, F. Heys, Dr. Howell Davies, and F. Van Niekerk.

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addition to £5,000 of 5 per cent. War Loan. The revenue increased £3,126, but the profit on properties sold was nearly £10,000 less, though the receipts on account of profits on sales (unrealised) in previous years was somewhat larger. The net profit was £22,479, and the ordinary dividend has been increased from 5 to 5½ per cent., leaving a balance of £29,911, including £26,085 unrealised.

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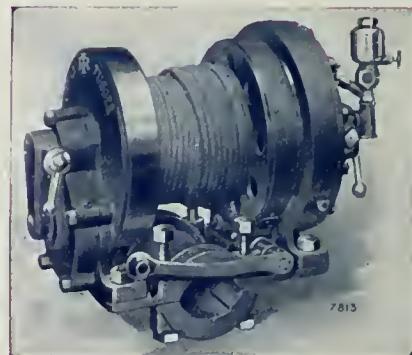
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